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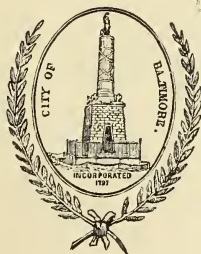
Annual Report
of the
Sewerage Commission
of the City of Baltimore

1913

ALBION
STREET
BALTIMORE

Annual Report
of the
Sewerage Commission
of the
City of Baltimore

1913



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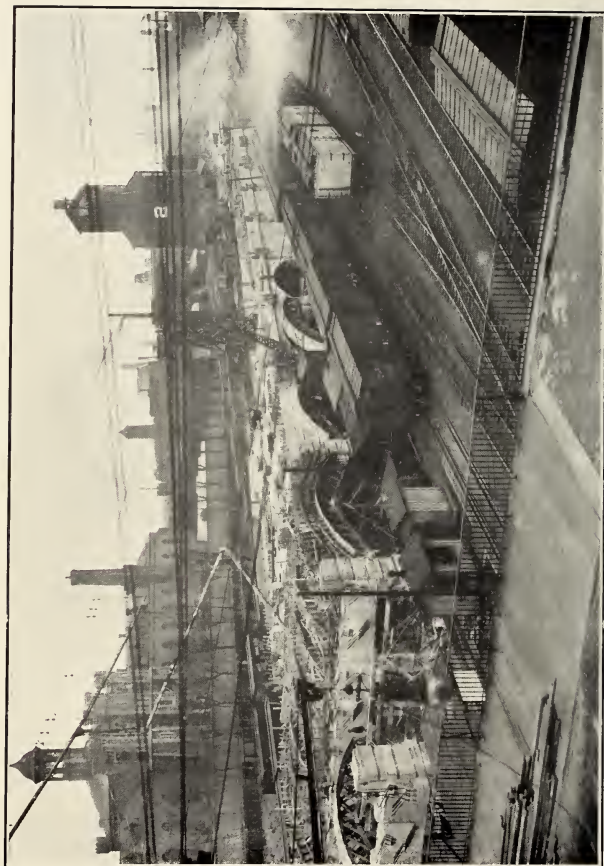
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FALLSWAY VIADUCT.

Looking South From Eager Street Bridge, Showing Retaining Walls Completed, and Forms for Arch Ribs of One Span Ready for Concreting. The Concrete Was Mixed at a Central Point and Was Distributed From the Top of a Tower 208 Feet High, Through Steel Troughs Suspended From Cables, as Shown in the Upper Left-Hand Corner.

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Engineering

SEWERAGE COMMISSION

OF THE

CITY OF BALTIMORE

AMERICAN BUILDING

BALTIMORE, December 31, 1913.

HON. JAMES H. PRESTON,

Mayor of Baltimore.

SIR:

In accordance with Section 1, Chapter 349, Acts of the General Assembly of Maryland, 1904, which requires the Sewerage Commission to annually make to the Mayor a detailed statement of its work and expenditures, we beg to submit the following report:

The death of Mr. William D. Platt, on December 23, 1913, deprived the Commission of a most useful member, and the City of a faithful servant. He was one of those originally appointed by the Mayor of Baltimore, June 19, 1905, and upon the organization of the Commission was elected vice-chairman. In the performance of all his duties he was faithful and efficient, and because of his many estimable traits he was highly esteemed by his colleagues.

On December 31, 1913, Thomas J. Shryock was appointed to fill the vacancy caused by the death of William D. Platt.

ACCOUNTS AUDITED.

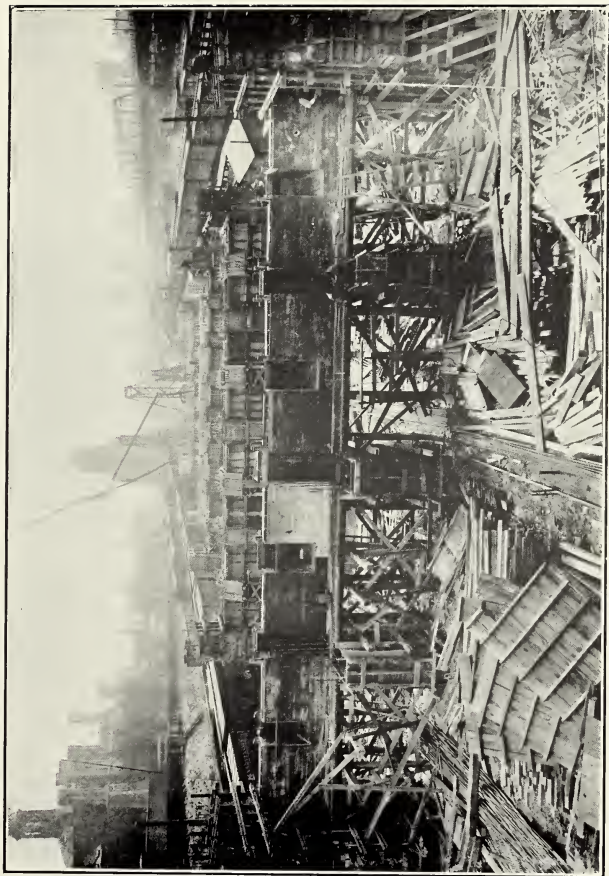
The books, accounts and vouchers of the Commission have been examined by the Baltimore Audit Company, from the date that the last report was submitted to you to the close of business December 31, 1913. The Audit Company reported that they had examined the books and accounts for 1913, which included the examination of original vouchers at the Comptroller's office in the City Hall, and are pleased to state that everything is correct.

EXPENDITURES, 1913.

A complete and detailed statement of disbursements for the year 1913 has been furnished the City Comptroller, as follows:

Administrative salaries	\$27,773 19
Construction salaries	239,812 31
Pumping Station salaries	16,643 51
Disposal Plant salaries	22,014 02
Cement Laboratory salaries	6,042 86
Repairing and Cleaning Sewers salaries.....	12,035 15
Pumping Station expenses.....	10,625 00
Disposal Plant expenses	5,993 16
Cement Laboratory expenses	705 46
Repairing and Cleaning Sewers expenses.....	259 34
Special expenses	35,641 23
Construction	3,712,891 50
Amount expended in 1913.....	<u><u>\$4,090,436 73</u></u>

The items, Salaries and Expenses of the Pumping Station, Disposal Plant and Repairing and Cleaning Sewers, aggregating \$67,570.18, are in fact maintenance cost. As a large number of taxpayers are being served by their operations, these expenses should not be considered in connection with construction.



FALLSWAY VIADUCT.

Looking South From Eager Street Bridge, Showing Form Work for Pier Girder. The Form for the South Side of the Girder, Including the South Skewbacks, Was in Place, But the Form for the North Side Was Not Set Up Until After the Reinforcing Steel Was Erected.

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The details of the construction represented by this large sum are given in the report of the Chief Engineer, submitted herewith. The accomplishment of so much work under varying conditions and many obstacles, is evidence of the high efficiency of the Engineering Department, and also entitles the employes of the Administrative Department to much credit for their accuracy and promptness in handling the accounts and vouchers, as stated in the report of the Audit Company.

CONTRACTS LET IN 1913.

Sanitary Contract No. 107, Frank Bruno & Co.....	\$118,893 52
Sanitary Contract No. 108, W. H. Thompson Cons. Co..	19,833 20
Sanitary Contract No. 109, Carozza, Lavezza & Carozza..	97,702 43
Sanitary Contract No. 110, McCarthy & O'Herron.....	147,768 94
Storm-water Contract No. 26, McCarthy & O'Herron.....	258,222 45
Storm-water Contract No. 27, Ryan & Reilly.....	39,610 05
Sanitary Contract No. 111, Middleton-Thompson Co.	157,763 40
Sanitary Contract No. 114, C. B. Clark & Co.....	100,162 40
Sanitary Contract No. 115, Carozza, Lavezza & Carozza..	26,042 49
Sanitary Contract No. 116, Gallagher, Boyle & Bryan...	190,001 80
Storm-water Contract No. 28, Guild & Co.....	97,993 10
Storm-water Contract No. 29, Whiting-Turner Cons. Co..	12,262 00
Sanitary Contract No. 117, W. H. Thompson Cons. Co..	51,658 75
Sanitary Contract No. 118, McCarthy & O'Herron.....	77,069 70
Sanitary Contract No. 121, Whiting-Turner Cons. Co.....	65,868 50
Storm-water Contract No. 30, McCarthy & O'Herron.....	93,916 75
Sanitary Contract No. 113, John Dannini.....	2,035 73
Storm-water Contract No. 31, Ryan & Reilly.....	31,382 90
Sanitary Contract No. 120, Whiting-Turner Cons. Co.....	55,947 50
Storm-water Contract No. 32, Guild & Co.....	26,805 20
Sanitary Contract No. 119, Gallagher, Boyle & Bryan.....	176,154 75
Sanitary Contract No. 122, James Ferry & Sons.....	52,426 00
Storm-water Contract, No. 33, Ryan & Reilly Co.....	103,303 20
Sanitary Contract No. 124, Carozza Brothers Co.....	80,552 25
Storm-water Contract No. 34, James Ferry & Sons.....	7,242 50
Sanitary Contract No. 112, Samuel T. Williams.....	9,092 00
Sanitary Contract No. 128, McCarthy & O'Herron.....	138,637 85
Total.....	<u>\$2,238,350 26</u>

DISPOSAL PLANT.

From time to time we have conferred with our Consulting Engineers as the work has progressed. As the Disposal Plant has only been put in operation to a limited extent, we thought it wise during the past year to have Mr. Rudolph Hering visit the plant and study its operation. He spent some time in making a thorough investigation of the problem presented, and has made a number of valuable suggestions, which either have been or will be acted upon. It is to be borne in mind that the highest degree of efficiency of the Disposal Plant is not likely to be reached until a larger proportion of the sewage of the City shall have been brought into treatment.

SLUDGE DISPOSAL.

In our last annual report reference was made to the possibility of the use of sludge as a fertilizing material. This question is still under investigation, and it is hoped that before long we shall have sufficient data to enable us to form a definite opinion on the subject. There is no doubt that sewage contains substances that are of importance in the cultivation of the soil; but it remains to be determined whether these can be separated from the sewage in sufficiently concentrated form at a sufficiently low cost to give them commercial value.

APPROPRIATIONS FOR FUTURE WORK.

The appropriation for sewer work for the year 1914 will exhaust the funds provided under the Sewerage Enabling Acts of 1904 and 1910. These two loans were intended to provide \$20,000,000, but because the Sewerage Stock could not be disposed of at par at a rate of interest most advantageous to the City, the sum actually available for all purposes will be approximately \$18,900,000. Nevertheless, the two loans would be sufficient to do the work of sewerage and draining the built-up

portions of the City and Annex, existing at the time the first estimates were made. These estimates will be found in the annual report of the Commission for 1907, which stated that the cost of the sanitary sewers as outlined in the report for 1906 would be about \$14,000,000, and that the entire storm-water system could be properly constructed for about \$4,500,000. These estimates were based upon a system of sewers designed to use the streets and alleys bringing a connection to every house in the City in such a way as to reduce the total number of miles of sewers to a minimum. The Legislature of 1910 passed an Act requiring the Commission to lay sewers in the alleys wherever practicable. It is estimated that this requirement increases the cost of the system about \$1,000,000. When the first estimates were made, it was understood that the work of the Commission would stop at the outside building line. It has since been decided to carry the front connection to the inside of the wall of the building, enabling the owners of small properties to connect their buildings with the City's sewers at less cost to them, adding to the cost of the system for this item approximately \$250,000. These changes, with the discounts on sales of Sewerage Stock, have reduced the amount considered available for construction of the sanitary and storm-water systems as contemplated in the original estimates, making the extension of sewers in the rapidly developed outlying portions of the City a serious problem with which to deal. The Commissioners for Opening Streets during the year made request for drainage construction in streets outside of the territory included in the original plan. The City Solicitor had advised them that the Act placed on the Sewerage Commission the duty of providing for the sewerage and drainage in connection with the new streets in the Annex. The Sewerage Commission was obliged to inform the Commissioners for Opening Streets that a certain amount of work had been planned in the built-up sections of the City which would exhaust all of the remaining funds. Moreover, it would be most

unfair to the taxpayers residing in the congested section of the City, who had been paying taxes for years, to go into the outlying parts where houses were few and far between and expend the money remaining at our disposal for drains, thus depriving the crowded sections of the City of much-needed sewerage privileges. In order to provide sewers and drains for these outlying districts, a further appropriation will be necessary to replace the funds the Commission was deprived of by shrinkage in the amount available on account of the above items. It is safe to say that the work can be brought to a state that might be called practical completion, with the further appropriation of \$3,000,000. It appears to the Commission that the extension of the sewers can be done more economically and promptly by the present organization (both administrative and engineering) than later on taking it up under a new organization.

Respectfully,

CHARLES ENGLAND, *Chairman*.

JAMES H. PRESTON, *Ex officio*.

MORRIS WHITRIDGE.

IRA REMSEN.

WILLIAM B. KINES.

GUSTAV SIEGMUND.

THOMAS J. SHRYOCK.

HARRY W. RODGERS, *Secretary*.



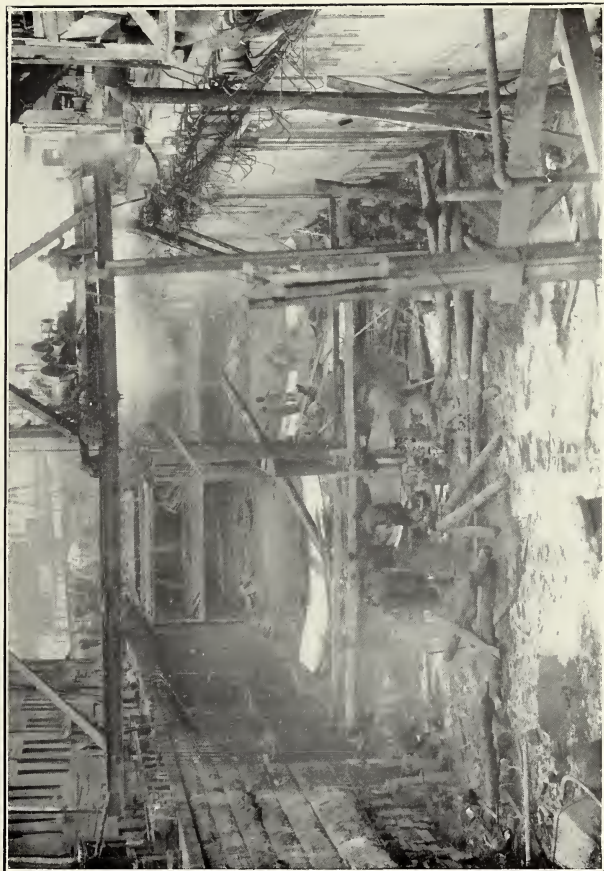
JONES' FALLS CONDUITS, SECTION No. 1.
Official Inspection of the Center Conduit After Completion.

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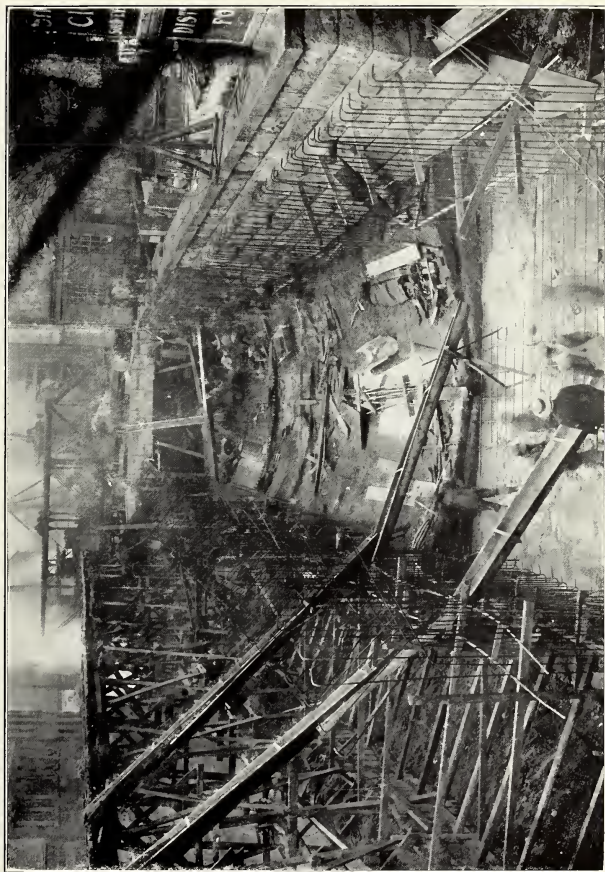
JONES' FALLS, CONDUITS, SECTION No. 1.
Northerly End of Section No. 1, After Completion, Showing Paying of Fallsaway. The Entire Dry-Weather Flow of Jones' Falls Is Diverted Into the East Conduit.

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JONES' FALLS CONDUITS, SECTION No. 1.
Driving Piles for Foundations of Center and West Conduits, Just North of Fayette Street.

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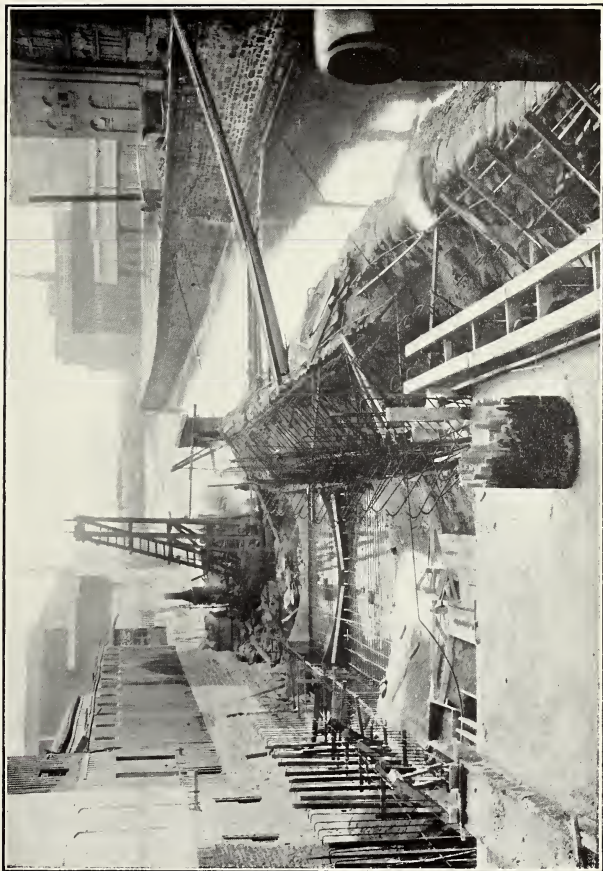
JONES' FALLS CONDUITS, SECTION No. 1.
 Looking North From Baltimore Street, Showing the Completed Invert of the East Conduit. The Concrete Mixer
 Was Located at Baltimore Street, Where Material was Loaded and Loaded by Trucks, and the Concrete
 Was Distributed Along the Line Work. A Specially Designed Hopper-Bottom
 Cars, Running on the Trestle Shown.

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JONES' FALLS CONDUITS, SECTION No. 1.
Looking South From Baltimore Street, Showing Cofferdam Under Construction at the Mouth of the East Conduit.

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JONES' FALLS CONDUITS, SECTION No. 1.
Looking South From Baltimore Street, Showing East Conduit Under Construction.

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JONES' FALLS CONDUITS, SECTION No. 1.

Looking South From Baltimore Street. The Inverts of the Conduits Are Extended Beyond the Side Walls for a Distance About Five Feet to Protect the Bottom From Scour. This View Shows the Invert Extension of the East Conduit Completed and the Extension of the Inverts of the Center and West Conduits Under Construction.

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ANNUAL REPORT
OF THE
CHIEF ENGINEER
FOR THE YEAR 1913

BALTIMORE, December 31, 1913.

MR. CHARLES ENGLAND, *Chairman; and*
Gentlemen of the Sewerage Commission.

DEAR SIRs:

I have the honor to present to you a report upon the work done by the Engineering Department of the Commission from January 1, 1913, to December 31, 1913.

The total value of the work completed during the year was about \$3,875,000. This embraces 139 miles of sewers, drains and house-connections, varying in size from 5 inches to 20 feet in diameter, in the beds of the streets and alleys of the City, and 1,541 catch-basins, and includes such work as the enclosing of Jones Falls, the diversion tunnel under Guilford avenue, the large 12x18-foot storm-water drain in Linwood avenue, and 18 acres of extensions and improvements to the Disposal Plant.

The difficulties and details necessary in constructing this amount of sewers and drains, in streets and alleys filled with all kinds of obstructions, is difficult to make clear to a layman, but is fully appreciated by engineers.

The sewer construction in Baltimore is further greatly complicated because of the Enabling Act requiring all sewage to be

purified, necessitating the separating of the storm-water from the sanitary sewage, thereby requiring the building of two separate systems of sewers and drains, crossing and recrossing each other in thousands of places. The supporting of buildings and taking care of the surface drainage and traffic is also a difficult problem, considering the scope of the work. The number of complaints, compared to the amount of work, shows that the work has been carried on with the minimum amount of interference with corporations, other City Departments, property-holders and traffic. The few law suits that have been instituted against the City, in connection with our work, have resulted in the City winning practically all of the cases, with one or two small exceptions.

JONES' FALLS.

The construction of the Jones' Falls Conduits has been completed from 100 feet south of Baltimore street, at which point the drainage problem has been solved, to the chamber at the entrance to the tunnel between Biddle and Chase streets, a distance of 5,484 feet, redeeming 428,300 square feet of land in the heart of the City, eliminating ten street bridges and one double-track railroad bridge and making possible the redemption of 175,000 additional square feet of land and the elimination of two additional railroad bridges.

This work, being in the bed of a running stream, subject to sudden floods, has been a most trying piece of construction, and it is therefore with considerable gratification that I am able to report it has been completed without law suits or serious loss to the contractor.

DIVERSION TUNNEL UNDER GUILFORD AVENUE.

The diverting of the Falls at a point in front of Union Station into a 29-foot tunnel under Guilford avenue, effected a very large saving by eliminating the long bend in the Falls.



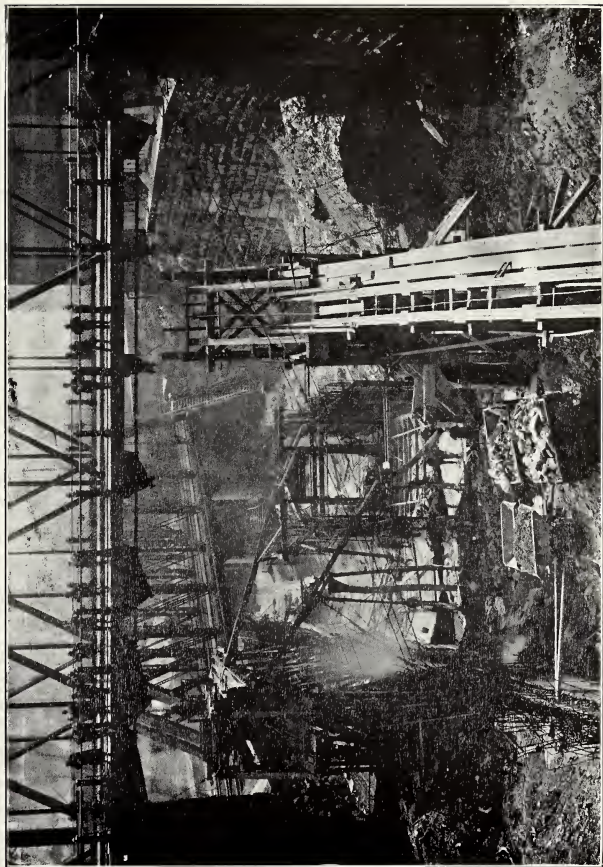
JONES' FALLS CONDUITS, SECTION No. 2.
Looking South From
Biddle Street, Showing the Entire Flow of Jones' Falls Diverted
Into the East Conduit During High-Water.

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JONES' FALLS CONDUITS, SECTION No. 2.
Looking South From the Entrance of the Guilford Avenue Diversion Tunnel, Showing End of Completed Section of the West Conduit, and Piers for Foundations of the Fallsview Viaduct.

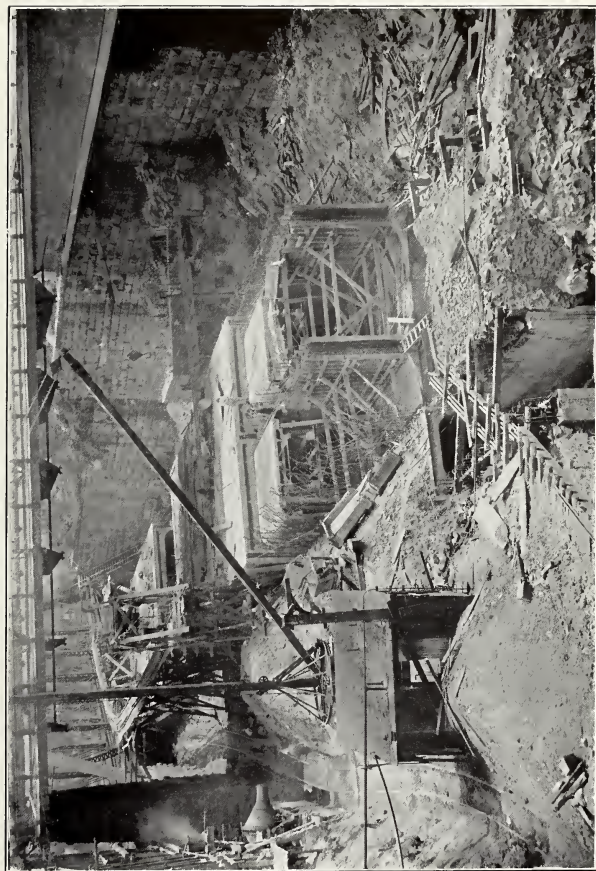
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JONES' FALLS CONDUITS, SECTION No. 2.

View Looking South Towards Biddle Street. The East Conduit Has Been Completed and Work Is in Progress on the Center and West Conduits. The Track in the Foreground Is the Contractor's Tippie for Unloading the Excavated Rock from the South End of the Guilford Avenue Tunnel. The Two Bridges Material Shown Will Be Eliminated When the Conduits and the Viaduct Are Completed.

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JONES' FALLS CONDUITS, SECTION No. 2.
Looking South From Biddle Street Bridge, Showing Work in Progress. The Dry-Weather
Flow of the Stream Is Carried by the East Conduit.

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Looking North Towards Chase Street Bridge, Showing Piers for Fallsway Viaduct. The Top of the Completed West Conduit Is Shown at the Right.

JONES' FALLS CONDUITS, SECTION No. 2.

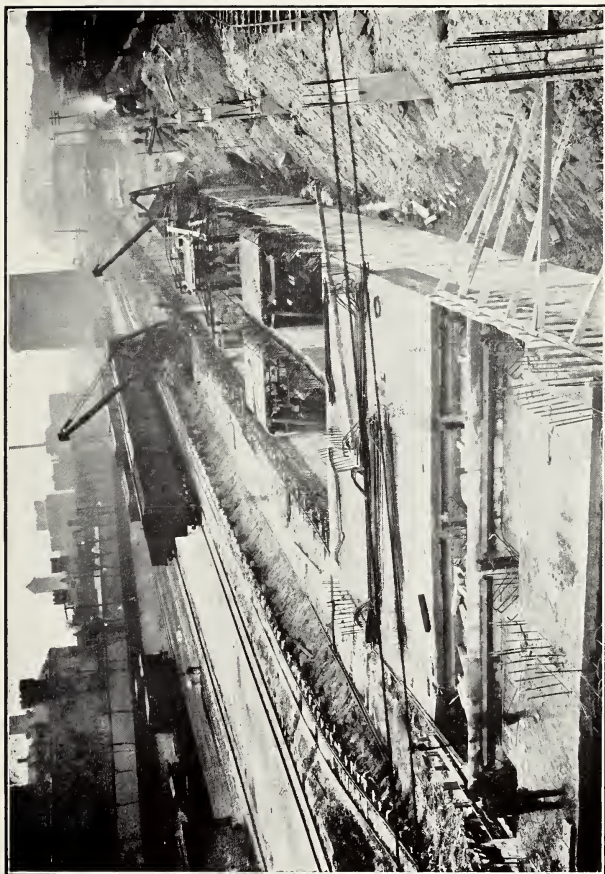
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JONES' FALLS CONDUITS, SECTION No. 2.

Looking South From Eager Street Bridge. The West Wall of the Completed East Conduit Appears on the Left. The Inverts and Side Walls of the Center and West Conduits Have Been Completed. The Travellers Used for Erecting the Steel Side-Wall Forms Are in Position in the West Conduit, Preparatory to Removing the Forms.

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JONES' FALLS CONDUITS, SECTION No. 2.

Looking South From Eager Street, Showing the East Conduit Completed, and the Center and West Conduits Under Construction. The Section of the Steel Wall for the Conduit Road Are in Position; Also the Travellers Used for Handling the Side-Wall Formwork. The Pier Foundations on the Right of the Photograph Are for the Foundations of the Fallsway Viaduct.

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shortening the construction about 700 feet and giving a large quantity of excellent rock from the tunnel for the concrete necessary in the construction, which factor secured a much lower bid from the contractor, and effected a saving to the City of approximately \$150,000.

The tunnel is 75 per cent. completed—the excavation at the southerly end being within 110 average feet of the the retaining wall of the Falls, between Biddle and Chase streets; the northerly end being within 97 average feet of the retaining wall in front of Union Station, and the concrete lining having been completed for a distance of 574 feet.

The difficulties the contractor has encountered in this construction have been many, and I regret to say that the sub-contractor, Lane Brothers Company, is one of the few contractors we have had to fail on us during the expenditure of some seventeen million dollars, involving many difficult pieces of construction. The original contractors, Fisher & Carozza, however, took over the work promptly and are pushing it in a much better manner than the sub-contractor was doing.

I am pleased to say, further, that for the past year we have been carrying the flow of Jones Falls through the east conduit, which was built for the ordinary flow, and although this conduit is the smallest of the three, on account of the smooth bore and calculated grades it has been able to take care of practically all the heavy storms we have had, which verifies our calculations in a most satisfactory manner.

PUMPING STATION.

It is a pleasure to report that the three 27,500,000-gallon pumps, which were put into operation on January 31, 1912, have worked in a most perfect manner since that time, and have been one of the means of relieving the odor from the harbor until we were able to intercept a sufficient amount of sewage to give permanent relief. This was done by inter-

.

cepting a large portion of the flow of Jones' Falls and pumping in to the Disposal Plant, there purifying it. On account of the rapid introduction of the sewerage system around the harbor, allowing us to intercept the sewage flowing into the harbor, we were able to discontinue the pumping of water from Jones' Falls on May 30, 1913. A sufficient number of houses in the low-level district have been connected to require the employment of three shifts at the Pumping Station, keeping the force at work day and night.

DISPOSAL PLANT.

At the time of starting the construction of the sewerage system we found available \$10,000,000 in bonds, being half of the amount necessary, according to our estimate. Not knowing whether sufficient funds to complete the entire system would become available later on, I endeavored to lay out the expenditure of this money in such a way, by building a certain amount of sewers in the City with a sufficiently large Disposal Plant at Back River, as to make the expenditure available as a working plant as far as the money went. This resulted in our constructing a Disposal Plant at Back River capable of taking care of 275,000 people. Immediately on the voting of the additional funds to complete the system (which loan, I am informed, passed by the largest vote ever received in the City of Baltimore), plans were made to bring the Disposal Plant up to a capacity of 600,000 people. Work on this extension has progressed in a satisfactory manner during the year. In the extension, improvements in detail have been made, and the plant is being kept up to the very latest word in sewage disposal, both in this country and abroad. The power and light secured by the flow of the sewage are giving most satisfactory results.

We have turned over to the Health Department about 40,000 houses for connection to the sewers and will have ready in a

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JONES' FALLS CONDUITS, SECTION No. 2.
Looking North From Monument Street Bridge, Showing West Wall of Completed East Conduit and Work
in Progress on Center and West Conduits. The Size and Arrangement of the Wall
Reinforcement is Clearly Shown.

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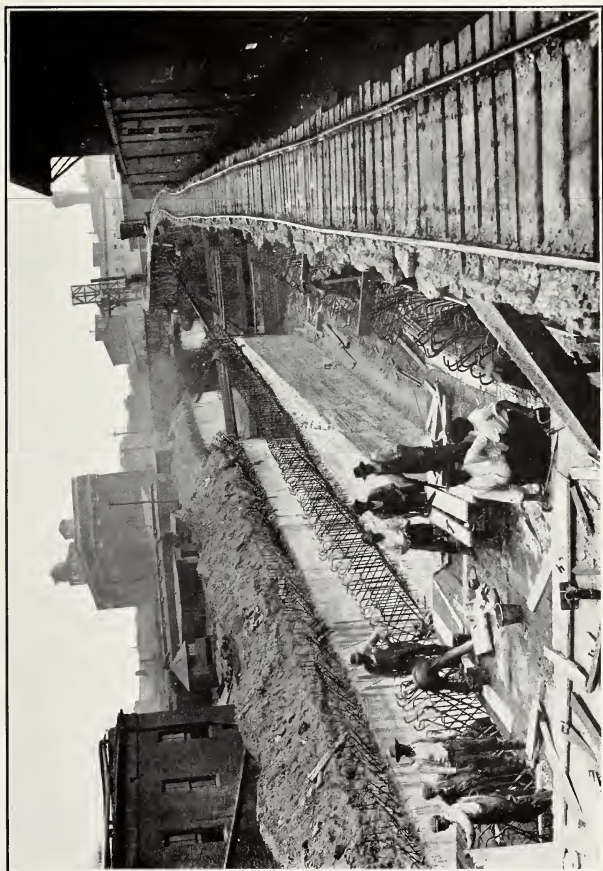
JONES' FALLS CONDUITS, SECTION No. 2.
Showing Work in Progress Under the Bridge at Monument Street. The Three Pipes Shown in the Center Are 30-Inch Cast-Iron Pipes, Which Were Built Into the Invert of the Center and West Conduits in Order to Discharge Existing Drains on the West Side of the Falls Into the East Conduit.

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JONES FALLS CONDUITS, SECTION No. 2.
Looking South Under Monument Street Bridge, Showing the West Wall of the Completed East Conduit, and
the Side-Wall Reinforcing and Completed Inverts of the Center and West Conduits.

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JONES' FALLS CONDUITS, SECTION No. 2.

Looking South From Monument Street Bridge, Showing Work in Progress on Center and West Conduits. The Track on the Right Was Used for Distributing Concrete From the Mixing Plant at Centre Street. The Flow of the Stream Has Been Diverted Into the Completed East Conduit, Which Is Covered by the File of Earth at the Left.

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JONES' FALLS CONDUITS, SECTION No. 2.
Looking North From the End of Section No. 1, Showing Derrick and Clam-Shell Bucket Used for Excavation.

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Looking North From the Northernly End of Section No. 1, Showing Wreckage Resulting From High-Water, August 2, 1913.

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JONES' FALLS CONDUITS, SECTION No. 2.
Looking South From Centre Street Bridge During High-Water, Showing the Entire Flow of
Jones' Falls Entering the Upper End of the East Conduit, Section No. 1.

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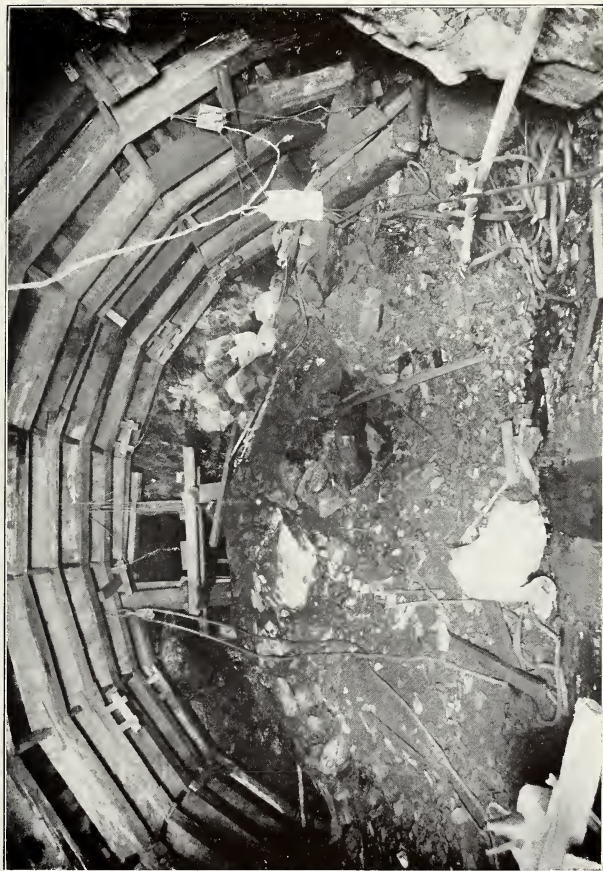
JONES' FALLS CONDUITS, SECTION No. 2.
Gulford Avenue Diversion Tunnel,
Showing Concrete Lining of Arch Completed.

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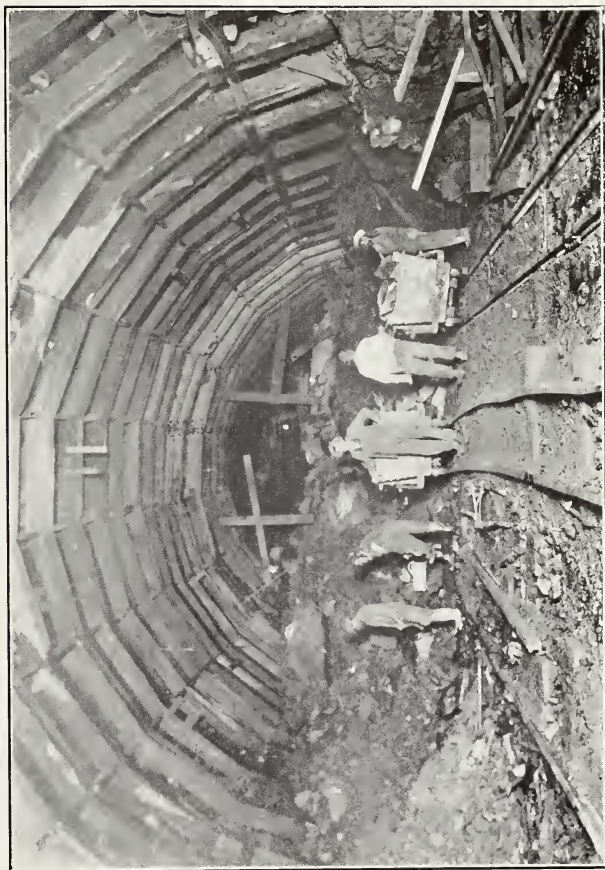
JONES' FALLS CONDUITS, SECTION No. 2.
Guilford Avenue Diversion Tunnel.
South Entrance of Heading.

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JONES' FALLS CONDUITS, SECTION No. 2.
Gulford Avenue Diversion Tunnel,
Showing 12-Inch by 12-Inch Segmental Lining, Which Was Used Where the
Roof Was of Earth or of Soft, Seamy Rock,

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JONES' FALLS CONDUITS, SECTION No. 2.
Gulford Avenue Diversion Tunnel,
Showing Timbering in Earth and Dump Cars Used for Removing Excavated Material.

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JONES' FALLS CONDUITS, SECTION No. 2.
Heading of the Guilford Avenue Diversion Tunnel.

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JONES' FALLS CONDUITS, SECTION No. 2.

Showing Junction of Tunnel for Jenkins' Run Sewer With Main Tunnel. The Branch Tunnel Was Used as an Outlet for the Material Excavated From the Main Tunnel.

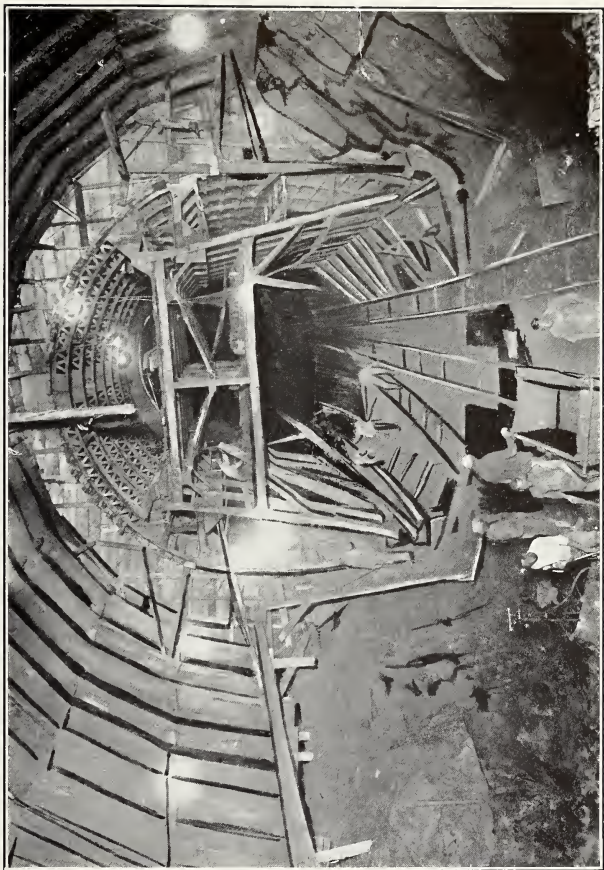
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JONES' FALLS CONDUITS, SECTION No. 2.

Showing Steel Centering of Forms for the Concrete Lining of the Arch. The Latticed Steel Ribs Extended From Invert to Invert, and the Forms From the Invert to the Springing Line Were of Steel. From the Springing Line to the Top of the Arch, 3-Inch Angling Was Laid on the Ribs, and Was Carried Up as the Concrete Was Placed. The Segmental Timbering Used in Soft Ground Is Shown in the Background.

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JONES' FALLS CONDUITS, SECTION No. 2;
Guilford Avenue Diversion Tunnel.
Showing Steel Forms for Concrete Lining and Segmental Timbering in Soft Ground Section.

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short time about 20,000 more. I understand that over 30,000 houses have been connected and are now draining to the Disposal Plant.

HYDRO-ELECTRIC PLANT.

In designing the Disposal Plant, arrangements were made to insert turbines at the point where the purified sewage was ready to be discharged into Back River. The flow of the purified sewage operates these turbines, which in turn run dynamos, producing more than sufficient power and light to operate the plant—a feature that stands out unique in sewage disposal, Baltimore being the only place where such power is secured.

FALLSWAY VIADUCT.

In accordance with the action of the Mayor and the Board of Estimates, employing me as Consulting Engineer to carry out the construction of the Viaduct, which action was approved by your Commission, I proceeded and designed the Viaduct along the general lines recommended in my report to the Commission in 1906.

This Viaduct is for the purpose of lifting the road-bed of the Fallsway, constructed over the top of the Jones' Falls reinforced conduits, from the present crossing of Madison street at the intersection of the Falls, to the present grade of Eager street, Chase street and Guilford avenue, crossing the Northern Central tracks above grade.

This contract was awarded to Stewart-Jones Company and Claiborne, Johnston & Company, at their bid of \$190,693.15. Later, through the sanction of the City Solicitor, the bonding companies and the Board of Estimates, the Stewart-Jones Company dropped out, leaving the work in the hands of Claiborne, Johnston & Company.

This contract covered the superstructure, over the roof of the conduits, as the foundations had been previously authorized by the Board of Estimates, after arranging with your Com-

mission to construct them in conjunction with the building of the conduits in the bed of the Falls, it being more economical to build the foundations for the Viaduct into the roof of the conduits while the latter were in process of construction. These foundations were constructed at the low unit prices obtained in the conduit work, the cost amounting to about \$25,000. Payment for this work is being made by the Commission on monthly estimates, to the contractor for Section No. 2 of the Jones' Falls Conduits, and upon its completion the amount expended is to be repaid to the Commission from the funds appropriated for the construction of the Fallsway.

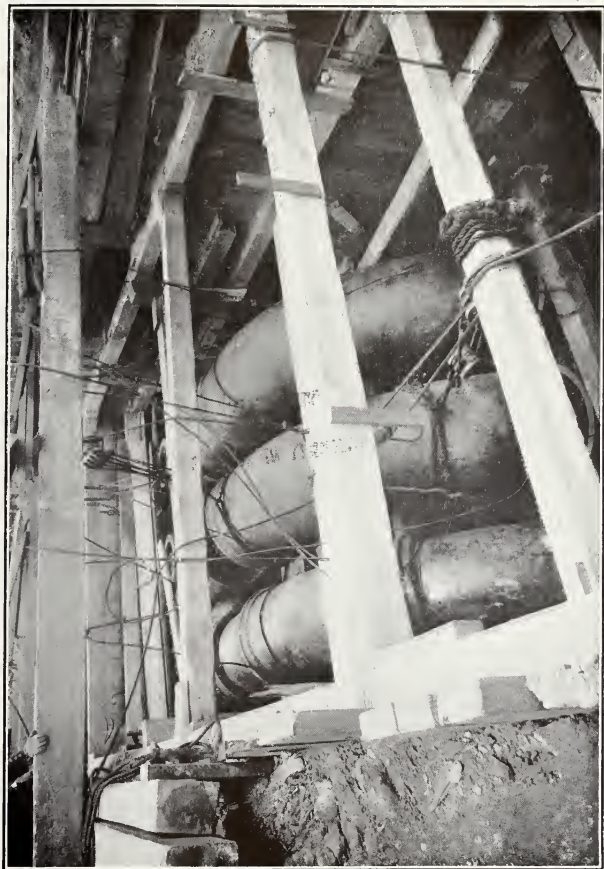
In designing the Viaduct, the first 438 feet, from Madison street north, starting at nothing and rising to a height of 15½ feet, was of such construction as would not permit of the building of arches from an architectural standpoint. It was designed so as to have the roadway of this portion laid on a fill between retaining walls. In place of letting a contract for the filling in of this space at additional cost to the City, I recommended that this be made a central dump, charging a price per load for dumping earth, thereby receiving a revenue instead of making an expenditure. This fill is proceeding in a very satisfactory manner, and arrangements have just been made with large contractors to begin running the dirt in very rapidly. Therefore, if the weather permits, in the course of a very short time I do not see why traffic cannot be diverted over the portion of the Viaduct from Eager street south, ahead of the paving, if so desired. However, it would be better if arrangements could be made to pave this section ahead of the other paving, immediately on our releasing it, which will be in advance of the fill being completed, if the weather conditions are favorable. This would be desirable from several standpoints. In this connection, careful consideration should be given to the question of the advisability of using bituminous joints in the paving of the Viaduct, for two reasons: First, we have expansion joints in the floor slab, which will be quite a factor in the



HIGH LEVEL INTERCEPTOR, SECTION No. 3.

West End of Siphon Which Carries the Interceptor Under Jones' Falls at Eager Street. This Siphon Is Composed of Three Lines of Cast-Iron Pipe, Two Being 42 Inches in Diameter and One 36 Inches. The Sewage Can Be Diverted to Any One or More of the Three Pipes, as Required, by Means of Stop Planks.

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HIGH LEVEL INTERCEPTOR, SECTION No. 3.
Top of Riser Pipes at Easterly End of Siphon Which Carries the Interceptor Under Jones' Falls at Eager Street. From This Point the Pipes Run on a Rising Grade to the Discharge Chamber.

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HIGH LEVEL INTERCEPTOR, SECTION No. 6.
Trench in Fayette Street, East of Carrollton Avenue. The Top of the Sewer at
This Point Is Twenty Feet Below the Surface of the Ground.

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future, and bituminous joints in the paving will allow the expansion and contraction to take place much better than a cement joint; second, it will reduce the noise, which is now complained of on the lower section of the Fallsway, where cement filler was used.

While the work on the Viaduct has not moved along as rapidly as desirable, the section between Madison and Eager streets has been a particularly tedious part. The contractor having assembled his plant, from now on, up to the mouth of the tunnel, there is no reason why the work should not proceed much more rapidly. I am pushing the contractor with this object in view.

In this connection, I wish to say that the Pennsylvania Railroad has co-operated with us in a most satisfactory manner, with reference to the adjustment of their tracks at the crossing of the Viaduct.

DESIGNING DEPARTMENT.

On account of the lack of information regarding underground structures, the very extensive ramifications of the sewerage system, the effort to interfere as little as possible with existing structures, and in order to give the contractor as much information as possible in making his bid, we have necessarily had to make extensive investigations of the records of all the City Departments and public service corporations; and, in addition, sink numerous test-pits. This has resulted in adding to our engineering cost, but it has been the means of effecting large savings to the City, by the contractors giving lower prices on account of having this information, and will result in the City having one of the most complete underground maps of any city in the country. It has also enabled us to do our work with the least possible interference with the structures of other City Departments and public service corporations. This has involved, since the beginning of the

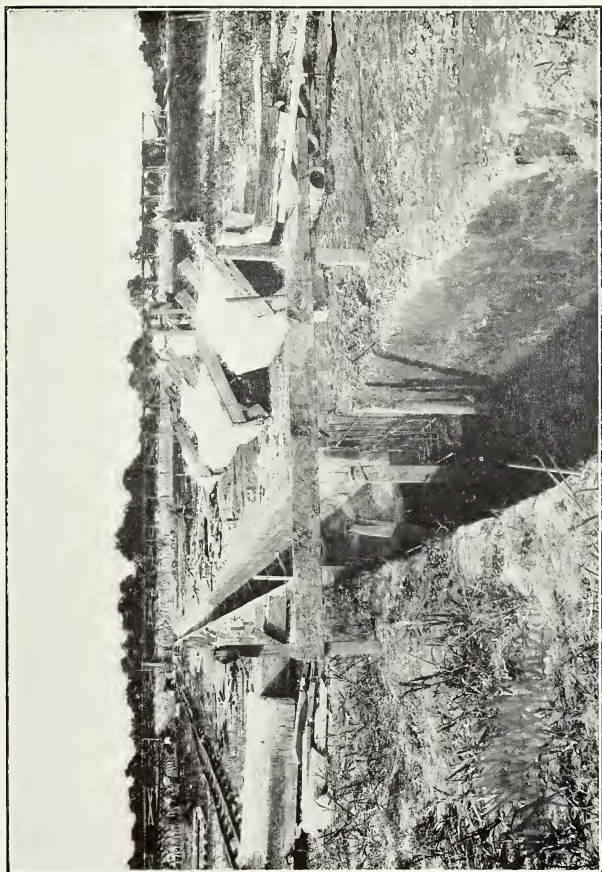
work, the preparation of 10,500 drawings. Included in this number are 107 record plats which have been entirely completed, and 383 partially completed. These plats, which form the foundation of our contract drawings, show street, lot and curb lines, existing sewers and drains, tracks, pipes and other structures, with depths, sizes and materials.

During the year 1913 we have passed nearly 19,500 permits for connections to the new sewers, requiring the giving of depth and location, and have examined about 2,500 plans submitted by the other City Departments, public service corporations, etc., to see that the proposed structures did not interfere with our work. In addition, about 2,000 plans were furnished for our information by the Gas Company, Telephone Company, etc. Since the beginning of our work, about 15,000 original drawings have been submitted by outside parties, either for approval or for our information, and about 10,000 additional duplicate drawings have been received, showing revisions or changes from the plans originally submitted, making a total of about 25,000 separate outside drawings passed on since our work began.

In planning and executing such work as the Baltimore Sewerage System, either one of two diametrically opposed policies may be followed:

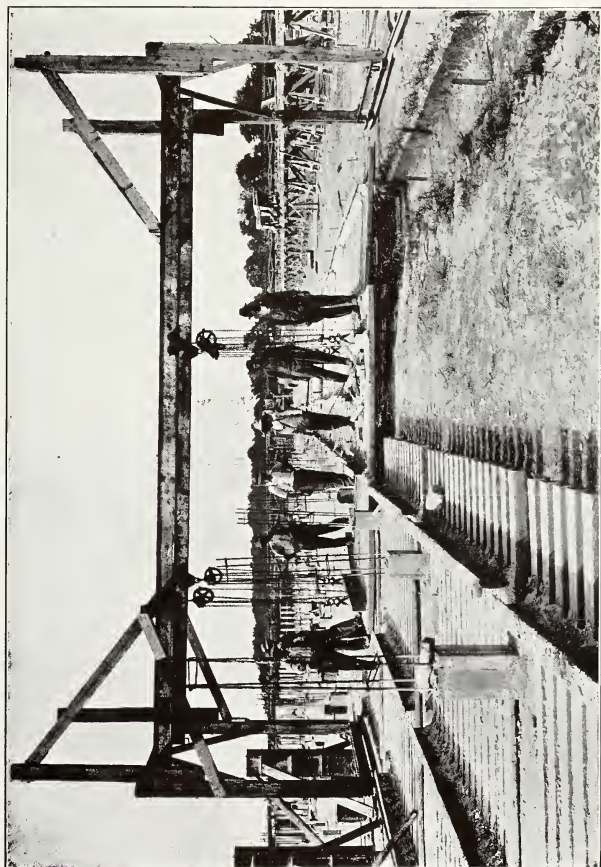
First—The plans and preliminary investigations may be of the most general character, leaving it to the contractor to make detailed investigations and to assume all risks of unknown conditions. If this plan is followed the contractor's prices are necessarily high, in order to cover contingencies.

Second—The plans and preliminary studies may be made in great detail, showing, so far as possible, all underground conditions and obstructions, and leaving as few things as possible to be covered by the contractor's allowance for contingencies. This method results in the lowest prices from the contractors and has been adopted by the Sewerage Commis-



SEWAGE DISPOSAL WORKS.
Excavation for Main Drain Under Sprinkling Filter.

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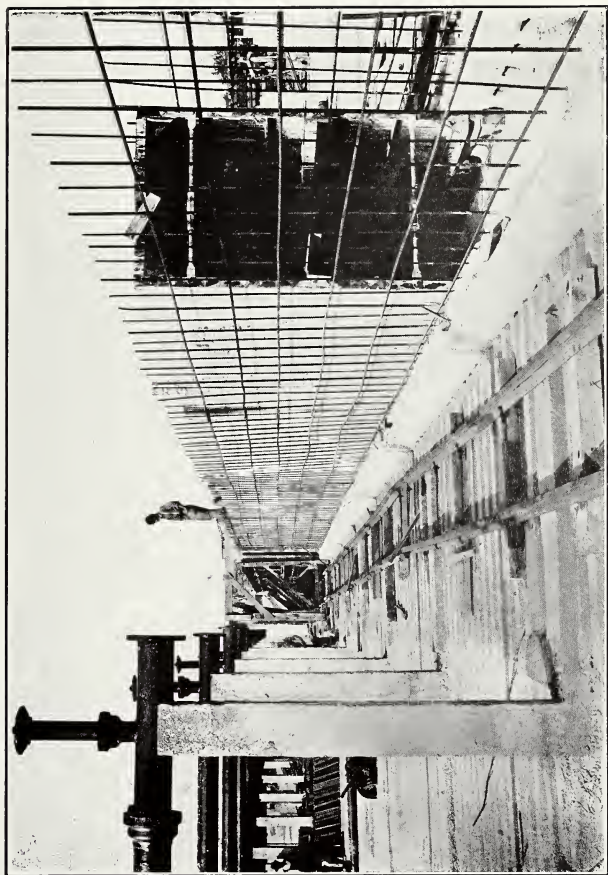
SEWAGE DISPOSAL WORKS.
Gantry Crane for Handling the Forms Used to Shape the Drainage Channels in the Filter Floors.

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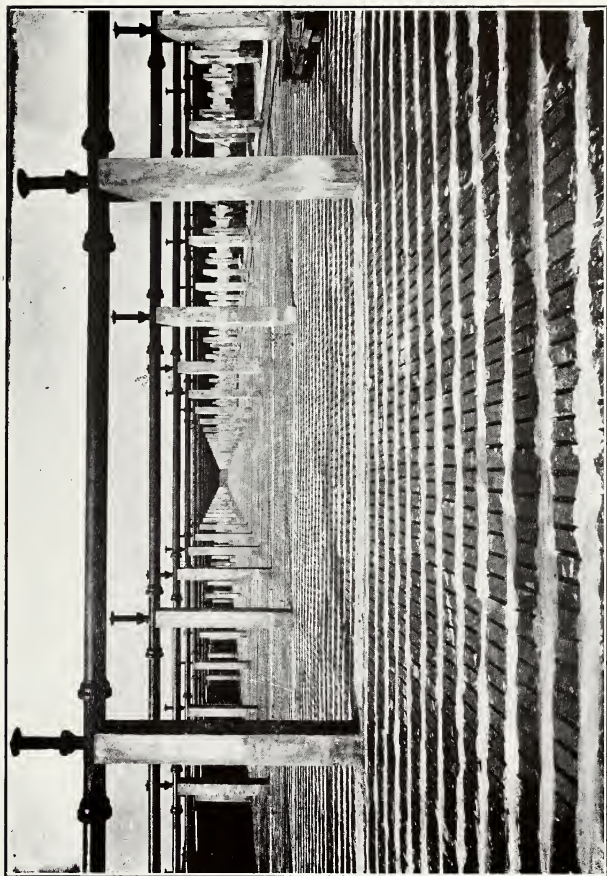
SEWAGE DISPOSAL WORKS.
Completed Floor of Single Flushing Gallery in Sprinkling Filter.

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SEWAGE DISPOSAL WORKS.
Single Flushing Gallery Under Construction, Showing Steel Forms for Side Walls and Roof.

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SEWAGE DISPOSAL WORKS.
Completed Floor of Sprinkling Filter and Piping System for Distributing Sewage.

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sion, with the result that we have secured very wide competition and generally low prices on all of the work which has been done. The saving secured by the lower prices has been many times greater than the additional cost of preparing the plans along the above lines.

TESTING STATION.

The Sewerage Commission's method of testing their cement and having a complete laboratory producing satisfactory results caused the Mayor and Board of Estimates to decide to place the testing of all cement purchased by the City's contractors under the jurisdiction of the Sewerage Commission. The Sewerage Commission having agreed to this proposition, our cement laboratory force was moved to the City Testing Station in July, 1912. During 1913 the laboratory sampled and tested 2,215 lots (representing 1,810,593 bags) of cement. The larger part of the cement tested was sampled in dealers' warehouses, and each bag was tagged, as the cement was intended to be sold in small quantities to different contractors. The cost of this work (sampling, tagging and testing) was unusually low, amounting to about three-quarters of a cent per bag. Where the cement was purchased in large lots to be used on specific pieces of work, the bags were not tagged, and the cost of sampling and tagging each lot of cement amounted to only \$2.04. The Commission bills the cost of operating the Cement Laboratory against the various departments by which the cement is used, the charge to each department being based on the amount of cement used by it.

The brands tested embrace the following: Alpha, Atlas, Dexter, Dragon, Edison, Giant, Lehigh, Matcham, Nazareth, Saylor, Security, Tidewater, Universal, Vulcanite and Whitehall.

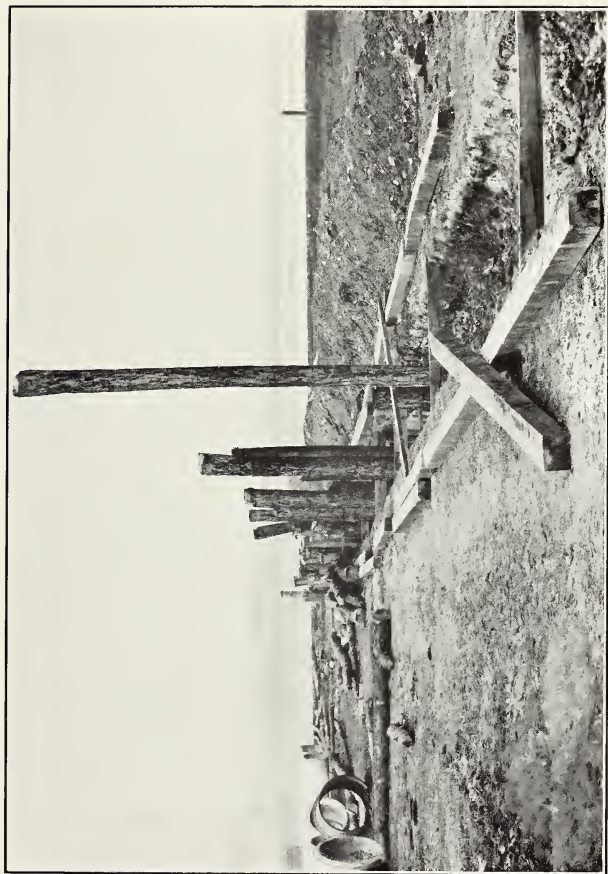
PHOTOGRAPHY.

In the subway construction in New York we found that the use of photography was a most important factor in our engineering work in saving money to the city in law suits. This feature was introduced in the Sewerage Commission's work from the very start and has resulted in producing evidence that has thwarted a great many law suits and enabled the City to win many others. Our method has been to carefully examine buildings before our work was started, and in the case of any defects, have them photographed; also, elevations taken on curbs and sills. While this has added to the first cost, it has, as stated above, enabled us to save large sums to the City.

NEW PAVING.

In order to meet the strenuous program of paving adopted by His Honor, the Mayor, I am gratified to report that we have been able to keep well in advance of the paving. On December 12, 1913, we called the attention of the Paving Commission to the fact that we had released about 37 miles of streets, in addition to those they had asked us for, which were then available for paving. Since then, we have released additional streets and are about ready to release a considerable number of miles more. This has only been possible by the most strenuous work on the part of everyone connected with the Sewerage Commission.

The pushing of the paving so closely behind such extensive sewerage and drainage work has placed the Commission in a very critical position, as the settlement of these trenches, covering such a tremendous area through various kinds of soils and under masses of pipes, makes a contingency that we have used every effort to overcome. It is therefore gratifying to have had practically no replacing of new pavements over our trenches, demonstrating that unusual care has been exercised in our backfilling.



DRIVING PILES FOR FOUNDATION OF OUTLET OF 42-INCH STORM-WATER DRAIN
THROUGH SWANN PARK AT MCCOMAS STREET.

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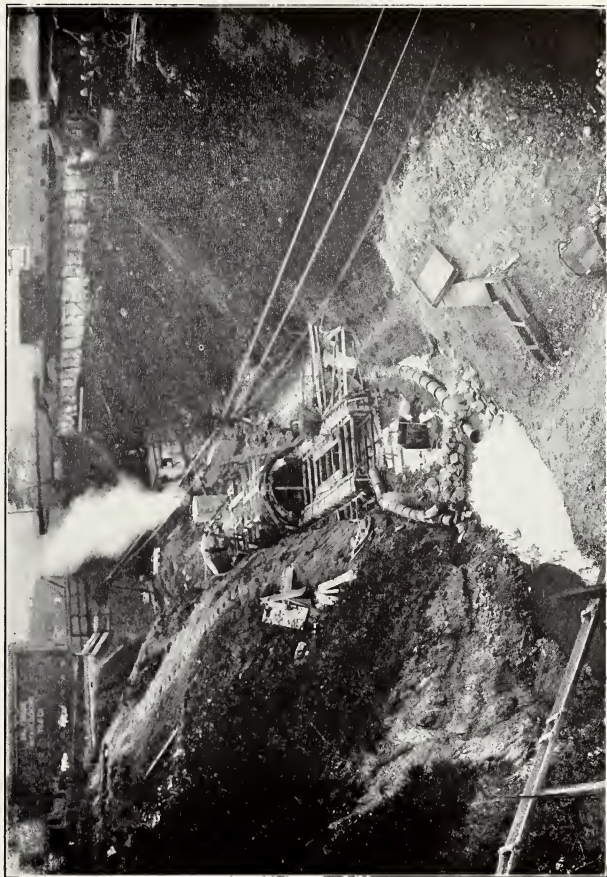
INLET CONNECTION AND MANHOLE ON STORM-WATER DRAIN AT LEADENHALL AND WEST STREETS.

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CROSS STREET STORM-WATER DRAIN.
Interior of Reconstructed Section at Race Street. The New Portion Is Built of Reinforced Concrete and Is of Rectangular Section, 9 Feet Wide and 3 Feet High.

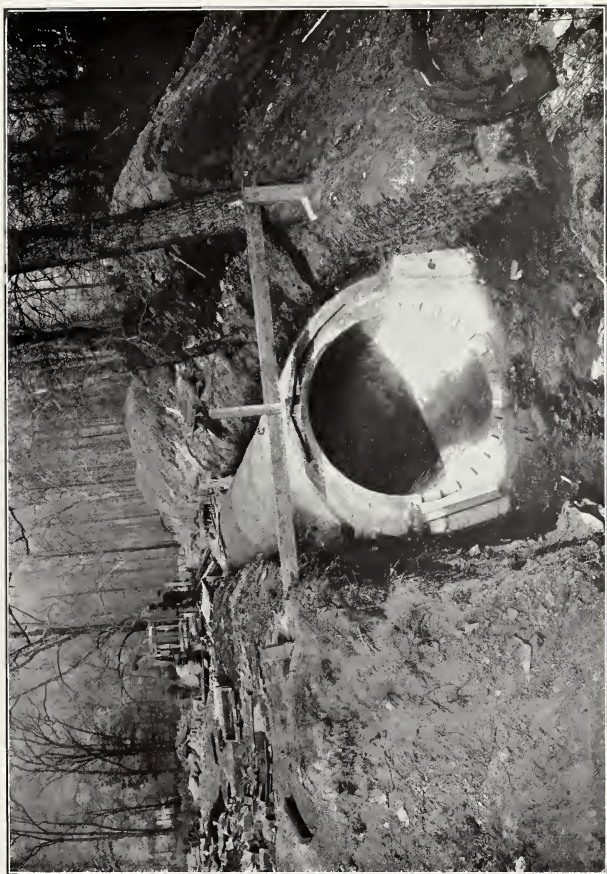
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SUMWALT RUN STORM-WATER DRAIN.

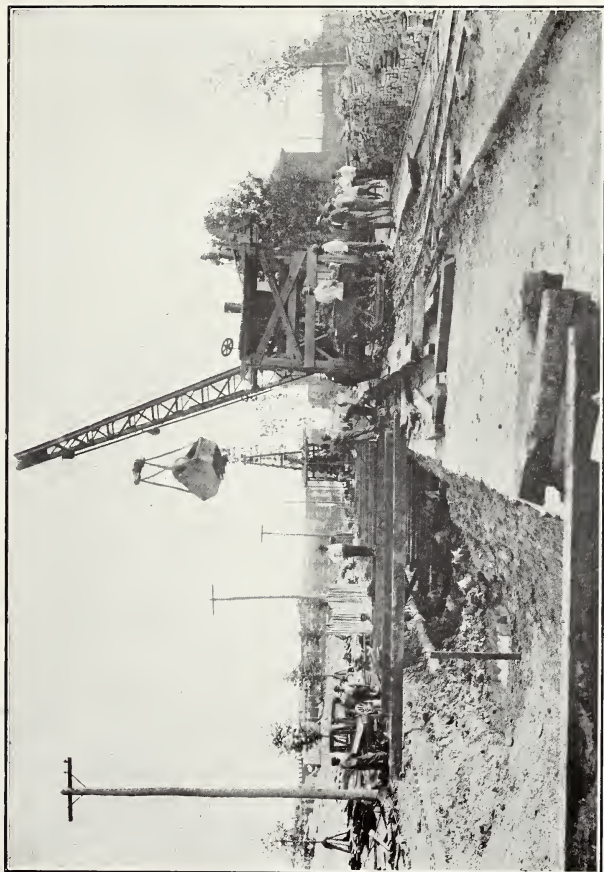
Showing Construction in Progress, North of Twenty-third Street and Method of Handling the Dry-Weather Flow of the Stream. The Drain Is Horseshoe Shaped and Is 10 Feet High by 9 Feet Wide at This Point.

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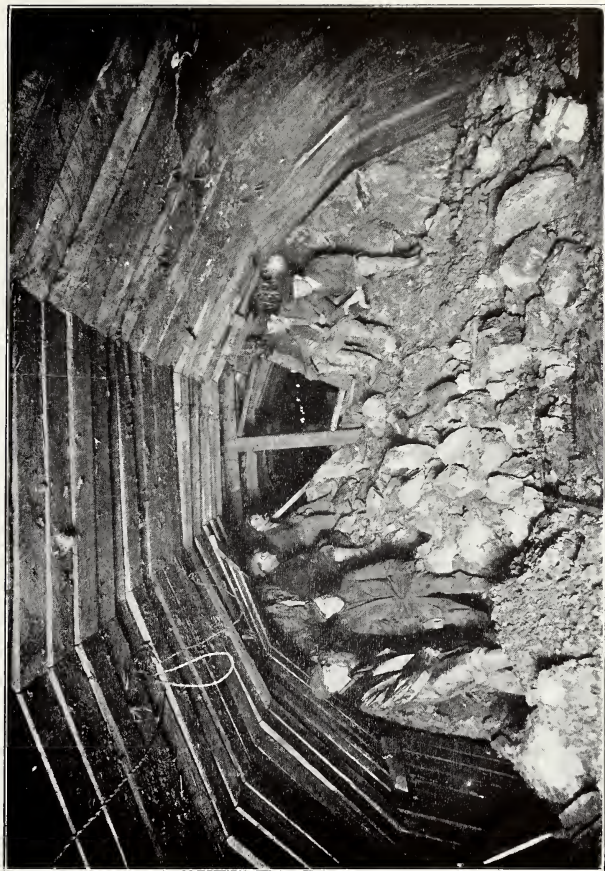
SUMMIT RUN STORM-WATER DRAIN.
Extension in Hargrove Alley, North of Thirty-second Street. The Drain Is 78 Inches in Diameter and Is Built of Concrete With Brick-Lined Invert.

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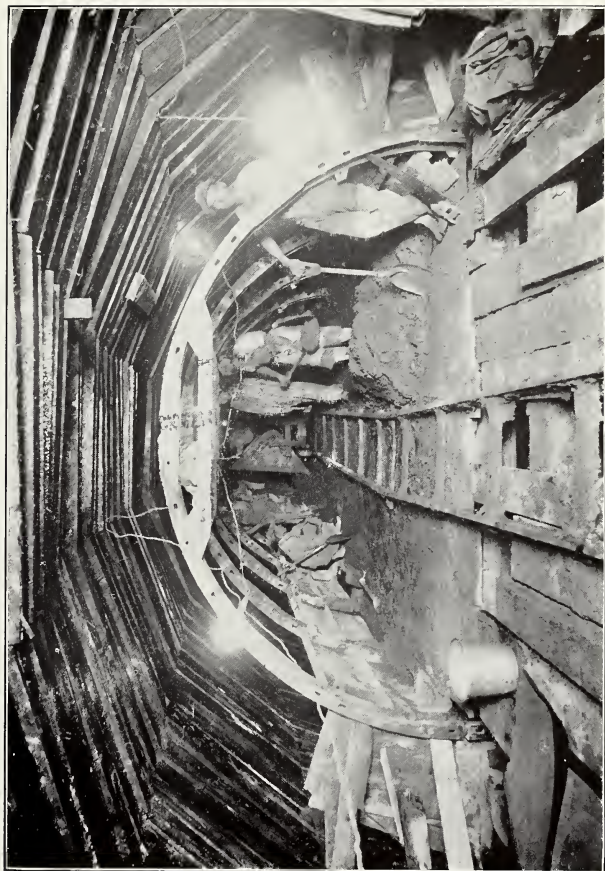
OGIER'S RUN INTERCEPTING STORM-WATER DRAIN,
Starting Excavation of Trench With a Locomotive Crane, Which Was Used to a Depth of About Ten Feet, the
Excavation Was Then Completed With the Cableway. The Pipe on the Left-Hand
Side of the Trench Is a 42-Inch Water Main.

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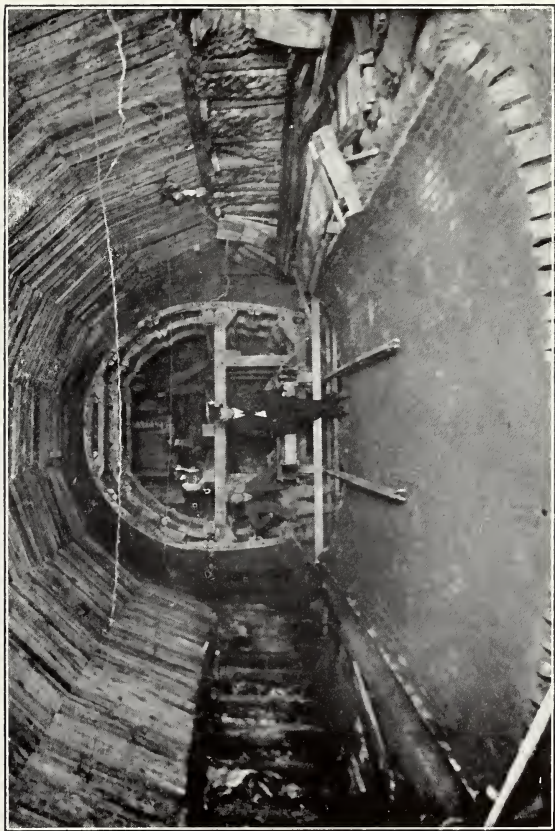
OGIER'S RUN INTERCEPTING STORM-WATER DRAIN.
Tunnel Under Linwood Avenue, Between Fleet Street and Falc Avenue, Showing Segmental Timbering
of Roof of Tunnel and Meeting of Headings.

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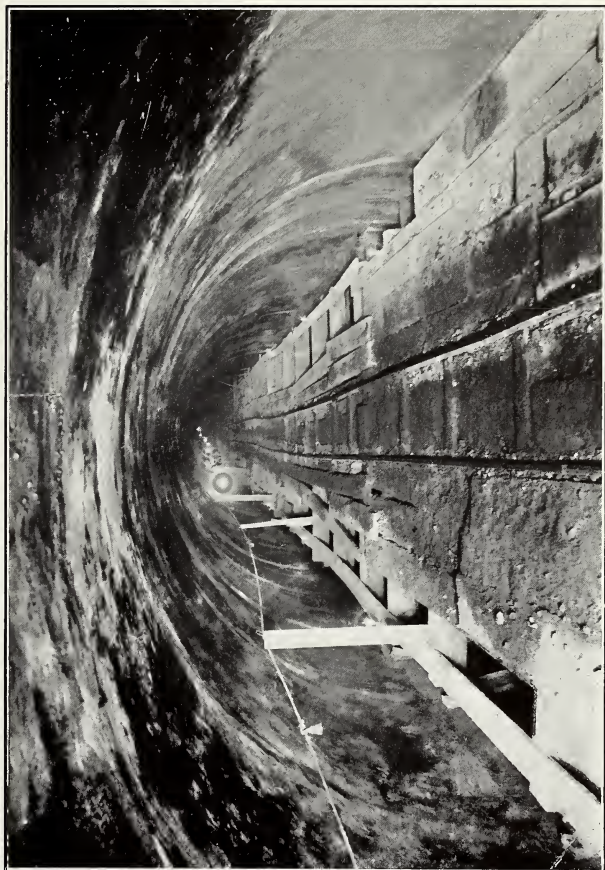
OGIER'S RUN INTERCEPTING STORM-WATER DRAIN.
Placing Concrete in Arch. The Steel Lagging of the Forms Is Carried Up in Sections as the Concrete Is Deposited.
The Drain Is Horseshoe Shaped, and Is 12 Feet 3 Inches High and 12 Feet 3 Inches Wide.

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OGIER'S RUN INTERCEPTING STORM-WATER DRAIN.
Showing Segmental Timbering of Roof, Steel-Centered Forms for Concrete Lining of Arch, and Completed Brick Invert. This Drain Is Horseshoe Shaped and Is 12 Feet 3 Inches High and 12 Feet 3 Inches Wide.

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OGIER'S RUN INTERCEPTING STORM-WATER DRAIN.
Completed Interior of Arch. The Concrete Was Mixed by Mechanical Mixers, Located at the Shafts and Was
Conveyed to Place by Means of the Construction Track Shown.

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The proper construction and efficiency of sewers and drains depends on carefully constructing them on calculated grades; and the further fact that sewer work is so quickly covered, makes it a class of work requiring most careful inspection, from both an engineering and inspection standpoint.

I have introduced 50 photographs and 5 tables showing the actual work in progress, in detail, which will give the layman a better idea of the magnitude and variety of the engineering work.

Respectfully submitted,

CALVIN W. HENDRICK,
Chief Engineer.

TABLE No. 1
PERSONNEL OF CHIEF ENGINEER'S STAFF

NAME	TITLE	ENTERED SERVICE	REMARKS
Thomas D. Pitts.....	First Assistant.....	June 4, 1906..	
Oliver W. Connet.....	Division Engineer.....	Jan. 2, 1906..	
Alfred H. Hartman....	Division Engineer.....	Jan. 15, 1906..	
H. C. McRae.....	Division Engineer.....	Jan. 21, 1907..	
W. A. Megraw.....	Office Engineer.....	Dec. 3, 1906..	Promoted from Asst. Div. Engr. Jan. 1, 1913.
F. H. Cronin.....	Mechanical Engineer....	May 9, 1911..	
John J. Neal.....	Asst. Mech. Engineer....	Nov. 9, 1906..	Trans. from Asst. Engr. "AA" Jan. 1, 1913.
John J. Frederick.....	Secretary.....	Oct. 1, 1905..	
J. Fletcher Apsey.....	Asst. Div. Engineer.....	Jan. 15, 1906..	Resigned May 5, 1913.
R. L. Burwell.....	Asst. Div. Engineer.....	June 24, 1907..	
Milton I. Ruark.....	Asst. Div. Engineer.....	Jan. 22, 1906..	Promoted from Asst. Engr. "AA" Jan. 1, 1913.
Ellott H. Burwell.....	Asst. Div. Engineer.....	Jan. 15, 1906..	Promoted from Asst. Engr. "AA" May 1, 1913.
Gustav J. Requaard....	Asst. Div. Engineer.....	June 23, 1909..	Promoted from Asst. Engr. "A" May 1, 1913.
Covington K. Allen....	Asst. Engineer "AA"....	June 1, 1907..	Resigned July 1, 1913.
Henry S. Shryock.....	Asst. Engineer "AA"....	May 1, 1906..	
Arthur C. Toner.....	Asst. Engineer "AA"....	Jan. 15, 1906..	Resigned Dec. 31, 1913.
F. W. McKinney.....	Asst. Engineer "AA"....	Jan. 1, 1912..	Resigned June 16, 1913.
Henry S. Regester, Jr..	Asst. Engineer "AA"....	Jan. 15, 1906..	Promoted from Asst. Engr. "A" June 16, 1913.
Frank H. Firoved.....	Asst. Engineer "AA"....	Jan. 23, 1906..	Promoted from Asst. Engr. "A" Jan. 1, 1913.
Frank J. Parran.....	Asst. Engineer "A"....	May 28, 1907..	
Harry F. Schaefer.....	Asst. Engineer "A"....	June 20, 1907..	
John Moore, Jr.....	Asst. Engineer "A"....	May 16, 1907..	
Robert Rumbold.....	Asst. Engineer "A"....	Feb. 1, 1906..	
F. D. Christliff.....	Asst. Engineer "A"....	July 7, 1909..	

TABLE No. 1—Continued.
PERSONNEL OF CHIEF ENGINEER'S STAFF.

NAME.	TITLE.	ENTERED SERVICE.	REMARKS.
J. Elmer Shepperd.....	Asst. Engineer "A".....	July 2, 1906.	
C. Boone Sadler.....	Asst. Engineer "A".....	Aug. 1, 1907.	
Edmund P. Burke.....	Asst. Engineer "A".....	Mar. 27, 1912.	
S. M. Klein.....	Asst. Engineer "A".....	Jan. 8, 1912.	
Ralph Hutchins.....	Asst. Engineer "A".....	Feb. 1, 1906.	
J. H. Ensey.....	Asst. Engineer "A".....	Nov. 29, 1911.	Resigned May 15, 1913.
G. Herman Carl.....	Asst. Engineer "A".....	Aug. 1, 1911.	Promoted from Asst. Engr. "B" April 1, 1913.
J. M. Bandel.....	Asst. Engineer "A".....	Mar. 18, 1912.	Promoted from Asst. Engr. "B" Aug. 1, 1913.
Irving P. Kane.....	Asst. Engineer "A".....	May 22, 1912.	Promoted from Asst. Engr. "B" Jan. 15, 1913.
C. I. Haven.....	Asst. Engineer "A".....	June 17, 1912.	Promoted from Insp. "C" to Insp. "B" May 1, 1913; to Asst. Engr. "A" July 1, 1913.
George W. Townsend..	Asst. Engineer "A".....	Nov. 18, 1907.	Promoted from Draftsman "A" Jan. 1, 1913.
S. O. S. Graham.....	Asst. Engineer "A".....	May 21, 1913.	
Leslie C. Frank.....	Asst. Engineer "A".....	Aug. 1, 1911.	Resigned Oct. 15, 1912; reappointed Sept. 17, 1913.
J. Wightman Cleaveland	Asst. Engineer "B".....	Dec. 24, 1906.	
J. Milton Knight.....	Asst. Engineer "B".....	Aug. 4, 1908.	
J. Lee Chapman.....	Asst. Engineer "B".....	Nov. 15, 1911.	Resigned July 1, 1911.
R. Taylor Tunstall.....	Asst. Engineer "B".....	Jan. 15, 1906.	
Harry M. Webb.....	Asst. Engineer "B".....	June 1, 1909.	
J. S. Thompson, Jr.....	Asst. Engineer "B".....	Oct. 3, 1911.	
Paul Wroth.....	Asst. Engineer "B".....	May 19, 1908.	
H. W. Johnning.....	Asst. Engineer "B".....	June 24, 1908.	Promoted from Inspector "C" May 1, 1913.
Thomas W. Sasser.....	Asst. Engineer "B".....	May 20, 1908.	Promoted from Inspector "C" to "B" July 1, 1913; transferred to Asst. Engr. "B" Nov. 15, 1913.
W. S. Wicker.....	Asst. Engineer "B".....	June 4, 1912.	

TABLE No. 1—*Continued*.
PERSONNEL OF CHIEF ENGINEER'S STAFF.

NAME.	TITLE.	ENTERED SERVICE.	REMARKS.
L. B. Gilmour.....	Asst. Engineer "B".....	June 12, 1911..	Promoted from Draftsman "C" to "A" Jan. 1, 1913; transferred to Asst. Engr. "B" May 1, 1913.
Carroll Edgar.....	Asst. Engineer "B".....	Oct. 4, 1912..	Promoted from Draftsman "C" May 1, 1913.
Julius O. Ziegfeld.....	Asst. Engineer "B".....	April 18, 1912..	Promoted from Draftsman "C" Sept. 15, 1913.
Dudley G. Frazer.....	Asst. Engineer "B".....	Aug. 1, 1911..	Promoted from Rodman "A" July 1, 1913.
William J. Frere, Jr....	Asst. Engineer "B".....	June 6, 1911..	Promoted from Rodman "A" July 1, 1913.
William C. Briscoe.....	Asst. Engineer "B".....	Nov. 16, 1909..	Promoted from Rodman "A" Jan. 15, 1913.
Adam W. Gerlach.....	Asst. Engineer "B".....	June 16, 1909..	Promoted from Stenog. "A" April 1, 1913.
W. L. Prout.....	Asst. Engineer "B".....	April 5, 1911..	Promoted from Stenog. "A" May 1, 1913.
H. G. Maynard.....	Asst. Engineer "B".....	June 23, 1909..	Promoted from Inspector "C" to "B" Feb. 15, 1913; transferred to Asst. Engr. "B" Nov. 15, 1913.
C. J. Hellen.....	Asst. Engineer "B".....	June 12, 1911..	Promoted from Rodman "A" Oct. 1, 1913.
Edward F. Davis.....	Inspector "A".....	Dec. 24, 1906..	
Charles S. York.....	Inspector "A".....	Nov. 7, 1906..	
John H. Sothoron.....	Inspector "A".....	July 5, 1907..	
Charles I. Hammond....	Inspector "A".....	Nov. 7, 1906..	
Authin D. Tapscott....	Inspector "A".....	Nov. 19, 1906..	
George T. Robinson....	Inspector "A".....	June 1, 1907..	Resigned Aug. 1, 1913.
Walter J. Caple.....	Inspector "A".....	July 5, 1907..	Resigned Nov. 30, 1913.
John C. Strohm.....	Inspector "A".....	Jan. 15, 1906..	Promoted from Inspector "B" Aug. 1, 1913.
Stephen A. Lusby.....	Inspector "B".....	April 6, 1907..	
Henry A. Albert.....	Inspector "B".....	June 1, 1907..	

TABLE No. 1—Continued.
PERSONNEL OF CHIEF ENGINEER'S STAFF.

NAME.	TITLE.	ENTERED SERVICE.	REMARKS.
John F. Garrett.....	Inspector	Nov. 16, 1906..	
Karl E. G. Kaufman....	Inspector	Jan. 15, 1906..	
H. DeWolf Theobald....	Inspector	Aug. 9, 1907..	
George E. Schaeffer....	Inspector	Aug. 11, 1908..	
E. B. Richards.....	Inspector	Jan. 15, 1906..	Resigned Oct. 15, 1913.
J. H. Gambrell.....	Inspector	Jan. 15, 1906..	
William H. Bell.....	Inspector	Dec. 19, 1906..	
William Byrd.....	Inspector	June 1, 1907..	Promoted from Inspector "C" Jan. 1, 1913.
George B. Roberts.....	Inspector	June 23, 1909..	Promoted from Inspector "C" Aug. 1, 1913.
Lawrence H. Francis....	Inspector	Jan. 15, 1906..	Promoted from Inspector "C" June 16, 1913.
William F. Dolliver....	Inspector	July 7, 1909..	Promoted from Inspector "C" May 1, 1913.
Norman E. Brice.....	Inspector	May 25, 1912..	Promoted from Inspector "C" May 1, 1913.
E. W. Magruder.....	Inspector	June 13, 1912..	Promoted from Inspector "C" May 1, 1913; resigned May 15, 1913.
R. E. L. Martin.....	Inspector	April 18, 1912..	Promoted from Inspector "C" July 1, 1913.
Claude R. Whitaker....	Inspector	April 1, 1912..	Promoted from Inspector "C" July 1, 1913.
A. I. Mulliken.....	Inspector	July 21, 1913..	Promoted from Inspector "C" Dec. 1, 1913.
J. C. Marlatt.....	Inspector	May 16, 1912..	Promoted from Inspector "C" May 1, 1913.
William A. Brogden....	Inspector	Nov. 7, 1906..	
Henry Kelly.....	Inspector	July 17, 1907..	Dropped June 4, 1913.
A. S. Bartholomaei....	Inspector	Oct. 9, 1907..	
William J. Boyle.....	Inspector	April 16, 1907..	Dropped April 1, 1913.
Martin W. Garrett.....	Inspector	July 19, 1908..	
John Lynch.....	Inspector	June 1, 1909..	
John Dougherty.....	Inspector	May 17, 1909..	

TABLE No. 1—Continued.
PERSONNEL OF CHIEF ENGINEER'S STAFF.

NAME.	TITLE.	ENTERED SERVICE.	REMARKS.
D. W. Glass.....	Inspector	Dec. 26, 1911..	Promoted from Inspector "D" April 1, 1913; resigned Oct. 1, 1913.
William Wagner.....	Inspector	Jan. 15, 1906..	
John T. Merritt.....	Inspector	Nov. 29, 1911..	
W. Knight Potter.....	Inspector	Oct. 3, 1911..	
W. K. Vickers.....	Inspector	Oct. 17, 1911..	
Stuart Anderson.....	Inspector	Feb. 5, 1912..	
A. J. Carey.....	Inspector	May 14, 1912..	Promoted from Inspector "D" April 1, 1913. Resigned Oct 31, 1913.
Newell D. Chase.....	Inspector	April 3, 1912..	
Louis Cremona.....	Inspector	May 1, 1912..	
H. R. Devilbiss.....	Inspector	May 8, 1912..	
L. N. Fisher.....	Inspector	June 17, 1912..	Promoted from Inspector "D" April 1, 1913. Resigned Sept. 23, 1913.
Alfred P. Gwynn.....	Inspector	Oct. 24, 1912..	Promoted from Inspector "D" May 1, 1913. Resigned Feb. 18, 1913.
Thomas S. Hauch.....	Inspector	May 7, 1912..	
William E. Hearing.....	Inspector	Mar. 14, 1912..	
George Kenly.....	Inspector	Oct. 3, 1912..	Promoted from Inspector "D" April 1, 1913; Resigned Sept. 1, 1912; reappointed June 24, 1913; resigned Sept. 1, 1913.
L. F. Magness.....	Inspector	June 17, 1912..	
Vincent T. Malcolm.....	Inspector	April 24, 1912..	
Kenneth T. Murphy.....	Inspector	June 25, 1913..	Promoted from Inspector "D" Dec. 15, 1913.
H. H. Tunis.....	Inspector	June 19, 1913..	
C. O. Boyd.....	Inspector	June 23, 1913..	
George R. Roberts.....	Inspector	July 14, 1913..	Resigned July 26, 1913.
R. D. Welsh.....	Inspector	June 24, 1913..	Promoted from Rodman "A" Dec. 15, 1913.
E. C. Densten.....	Inspector	July 21, 1913..	

TABLE No. 1—Continued.
PERSONNEL OF CHIEF ENGINEER'S STAFF.

NAME.	TITLE.	ENTERED SERVICE.	REMARKS.
W. C. Geissler.....	Inspector	July 24, 1913..	Promoted from Inspector "D" Dec. 15, 1913.
R. E. Turley.....	Inspector	July 22, 1913..	Promoted from Inspector "D" Dec. 15, 1913.
W. T. Stone.....	Inspector	Aug. 1, 1913..	Resigned Aug. 30, 1913.
Martin G. Shields.....	Inspector	April 18, 1913..	
A. A. Dyer.....	Inspector	April 18, 1913..	
Chas. Hildebrand, Jr.....	Inspector	Sept. 4, 1913..	Promoted from Inspector "D" Dec. 1, 1913.
R. B. Warren.....	Inspector	Nov. 6, 1912..	Promoted from Inspector "D" Oct. 1, 1913.
John Yearwood.....	Inspector	May 15, 1913..	
Roland W. Bates.....	Inspector	April 15, 1913..	
C. W. Henderson.....	Inspector	July 7, 1909..	Resigned Sept. 18, 1909; reappointed April 21, 1913.
J. K. Bossee.....	Inspector	April 21, 1913..	Promoted from Inspector "D" Aug. 15, 1913.
W. C. Begg.....	Inspector	July 24, 1913..	Promoted from Inspector "D" Dec. 15, 1913.
F. H. Plack.....	Inspector	June 10, 1913..	Promoted from Inspector "D" Dec. 1, 1913.
C. M. Fuller.....	Inspector	June 16, 1913..	Promoted from Inspector "D" Dec. 1, 1913.
S. A. Merriam.....	Inspector	June 5, 1913..	Dropped July 16, 1913.
G. G. B. Nelson.....	Inspector	Mar. 18, 1912..	Laid off Jan. 1, 1913.
J. A. Reynolds.....	Inspector	Oct. 17, 1912..	
Joseph W. Rogers.....	Inspector	April 24, 1912..	Resigned April 22, 1913.
H. T. Sasscer.....	Inspector	June 6, 1912..	Promoted from Inspector "D" April 1, 1913.
Charles P. Schlarb.....	Inspector	June 1, 1912..	Promoted from Inspector "C" Feb. 1, 1913.
John E. Sheridan.....	Inspector	Feb. 16, 1912..	
Ballard R. Smith.....	Inspector	June 1, 1912..	Promoted from Inspector "D" June 1, 1913.
C. F. Tausky.....	Inspector	Mar. 20, 1912..	
G. E. Warren.....	Inspector	June 17, 1912..	Resigned April 1, 1913.

TABLE No. 1—Continued.
PERSONNEL OF CHIEF ENGINEER'S STAFF.

NAME.	TITLE.	ENTERED SERVICE.	REMARKS.
L. B. Williams.....	Inspector "C"	Oct. 25, 1912..	Resigned Mar. 17, 1913.
L. Chase Wright.....	Inspector "C"	May 17, 1912..	Resigned April 15, 1913.
W. Howard Corrdry....	Inspector "C"	June 1, 1912..	Promoted from Draftsman "C" April 1, 1913.
M. W. Loving.....	Inspector "C"	June 1, 1912..	Promoted from Draftsman "C" Dec. 1, 1913.
L. Carroll Miller.....	Inspector "C"	June 25, 1912..	Promoted from Rodman "A" Sept. 1, 1913.
Edwin H. Nordman.....	Inspector "C"	Jan. 25, 1906..	Promoted from Rodman "A" Jan. 1, 1913.
Charles W. Rose.....	Inspector "C"	April 17, 1912..	Promoted from Rodman "A" July 1, 1913.
S. T. W. Green.....	Inspector "C"	Oct. 14, 1912..	Promoted from Rodman "B" to Rodman "A" Jan. 1, 1913.
		Jan. 2, 1912..	Promoted from Rodman "B" to Inspector "C" July 1, 1913.
L. E. Massey.....	Inspector "D"	Nov. 6, 1912..	Resigned Mar. 17, 1913.
J. Robert Owens.....	Inspector "D"	April 15, 1912..	
L. D. Sasser.....	Inspector "D"	May 15, 1912..	
M. J. Slingluff.....	Inspector "D"	Oct. 14, 1912..	
Edwin J. Wolfe.....	Inspector "D"	June 1, 1912..	
E. Bernard Green.....	Inspector "D"	April 10, 1912..	
E. H. Howard.....	Inspector "D"	Mar. 8, 1912..	Promoted from Rodman "B" Aug. 1, 1913.
Herbert N. Chipchase..	Inspector "D"	Nov. 1, 1911..	Promoted from Rodman "B" April 15, 1913.
H. C. Brooks.....	Inspector "D"	Oct. 16, 1912..	
J. B. Maguire.....	Inspector "D"	Oct. 11, 1912..	
W. G. Nicholson.....	Inspector "D"	May 15, 1913..	
J. C. Spedden.....	Inspector "D"	May 19, 1913..	Dropped June 26, 1913.
P. R. Powell.....	Inspector "D"	June 9, 1913..	Resigned Dec. 31, 1913.
H. W. Driver.....	Inspector "D"	June 18, 1913..	Resigned Sept. 15, 1913.
D. S. Craig.....	Inspector "D"	June 23, 1913..	Resigned Nov. 10, 1913.
L. V. Keeler.....	Inspector "D"	June 23, 1913..	

TABLE No. 1—Continued.
PERSONNEL OF CHIEF ENGINEER'S STAFF.

NAME.	TITLE.	ENTERED SERVICE.	REMARKS.
George F. Shaw.....	Inspector "D".....	July 28, 1913..	
John T. Brooks.....	Inspector "D".....	Sept. 8, 1913..	
C. A. Kastendike.....	Inspector "D".....	Sept. 6, 1913..	Resigned Sept. 20, 1913.
J. K. Kearney.....	Inspector "D".....	Oct. 22, 1913..	
Theo. C. Schaezle.....	Inspector "D".....	July 29, 1913..	
William R. Seth.....	Inspector "D".....	Oct. 6, 1913..	
Claude A. Murphy.....	Draftsman "A".....	Jan. 6, 1906..	
Maurice F. Rodgers.....	Draftsman "A".....	Dec. 1, 1905..	
Clarence G. Harg.....	Draftsman "A".....	April 20, 1908..	
Robert Dall, Jr.....	Draftsman "A".....	July 18, 1910..	
Horace A. Brown.....	Draftsman "A".....	July 5, 1907..	
Thomas D. Conn.....	Draftsman "B".....	Nov. 21, 1910..	
C. Edgar Wood.....	Draftsman "B".....	Oct. 3, 1911..	
Samuel Appleby.....	Draftsman "B".....	Aug. 1, 1911..	
C. F. Black.....	Draftsman "B".....	June 12, 1911..	Promoted from Draftsman "C" April 1, 1913.
Albert C. Betz.....	Draftsman "B".....	May 1, 1912..	Promoted from Draftsman "C" July 1, 1913.
W. Graham Cole.....	Draftsman "B".....	June 3, 1912..	Promoted from Draftsman "C" July 1, 1913.
William L. Iardella.....	Draftsman "B".....	Mar. 3, 1911..	Promoted from Draftsman "C" May 1, 1913.
C. L. Ofenstein.....	Draftsman "B".....	Nov. 1, 1912..	Promoted from Draftsman "C" July 1, 1913.
F. F. Davenport.....	Draftsman "C".....	April 16, 1912..	Promoted from Draftsman "C" April 15, 1913.
C. J. Flayhart.....	Draftsman "C".....	June 13, 1912..	
E. M. Hamilton.....	Draftsman "C".....	July 3, 1912..	Dropped June 1, 1913.
Walter E. Lee.....	Draftsman "C".....	Dec. 9, 1912..	Resigned Feb. 15, 1913.
D. H. Lucchesi, Jr.....	Draftsman "C".....	May 7, 1912..	
Samuel A. Mazer.....	Draftsman "C".....	June 3, 1912..	

TABLE No. 1—Continued.
PERSONNEL OF CHIEF ENGINEER'S STAFF.

NAME.	TITLE.	ENTERED SERVICE.	REMARKS.
J. L. Miller.....	Draftsman	"C"..... April 24, 1912..	Resigned Oct. 1, 1912; reappointed July 2, 1913; resigned Oct. 1, 1913.
W. K. Miller.....	Draftsman	"C"..... July 29, 1912..	
George McLean.....	Draftsman	"C"..... May 1, 1912..	
Walter J. O'Neill.....	Draftsman	"C"..... Oct. 10, 1912..	Resigned Aug. 15, 1913.
Edwin A. Plitt.....	Draftsman	"C"..... Nov. 14, 1912..	
Leslie B. Pope.....	Draftsman	"C"..... April 3, 1912..	
Richard J. Reese.....	Draftsman	"C"..... Sept. 25, 1912..	Resigned April 24, 1913.
William C. Runge.....	Draftsman	"C"..... Oct. 21, 1912..	
Herman A. Schneider...	Draftsman	"C"..... April 12, 1912..	
A. L. Shalowitz.....	Draftsman	"C"..... Oct. 1, 1912..	Resigned Sept. 15, 1913. Resigned July 30, 1913. Resigned July 4, 1913.
John K. Siems.....	Draftsman	"C"..... Nov. 11, 1912..	
William H. Siems.....	Draftsman	"C"..... May 7, 1912..	
E. Tschudy.....	Draftsman	"C"..... July 31, 1913..	Promoted from Draftsman "C" April 15, 1913.
Milton D. Swartz.....	Draftsman	"C"..... Oct. 24, 1913..	
H. S. Steelman.....	Draftsman	"C"..... Sept. 4, 1913..	
Otto F. Manger.....	Draftsman	"C"..... Feb. 24, 1913..	Promoted from Draftsman "C" April 15, 1913.
C. E. Keefe.....	Draftsman	"C"..... May 24, 1913..	
J. Albert Schad.....	Draftsman	"C"..... June 12, 1913..	
Charles F. Gross.....	Draftsman	"C"..... June 16, 1913..	Promoted from Draftsman "C" April 15, 1913.
W. J. Kellinger.....	Draftsman	"C"..... June 23, 1913..	
Ronald T. Anderson...	Draftsman	"C"..... Nov. 3, 1913..	
J. W. Faulconer.....	Draftsman	"C"..... April 24, 1913..	Promoted from Draftsman "C" April 15, 1913.
Edwin Fitzell.....	Draftsman	"C"..... Aug. 2, 1913..	
J. Arthur Clark.....	Rodman "A"	..... June 10, 1912..

TABLE No. 1—Continued.
PERSONNEL OF CHIEF ENGINEER'S STAFF.

NAME.	TITLE.	ENTERED SERVICE.	REMARKS.
Harry P. Poole.....	Rodman "A".....	May 16, 1912..	Transferred from Draftsman "C" Oct. 1, 1913.
J. Franklin Diggs.....	Rodman "A".....	Oct. 3, 1911..	
William A. Twamley.....	Rodman "A".....	Dec. 4, 1911..	
Wilford H. Herbert.....	Rodman "A".....	July 16, 1906..	
Owen Laws.....	Rodman "A".....	June 3, 1912..	Promoted from Rodman "B" Feb. 1, 1913. Promoted from Rodman "B" July 1, 1913. Promoted from Rodman "B" Aug. 1, 1913. Promoted from Rodman "B" Jan. 1, 1913; resigned Nov. 15, 1913. Promoted from Rodman "B" April 15, 1913. Promoted from Rodman "B" July 1, 1913. Promoted from Rodman "B" July 1, 1913. Promoted from Rodman "B" Dec. 1, 1913.
C. F. Martin.....	Rodman "A".....	May 13, 1912..	
John T. Rooney.....	Rodman "A".....	July 1, 1912..	
A. H. Wernsdorfer.....	Rodman "A".....	Mar. 18, 1912..	
William B. O'Connor.....	Rodman "A".....	Oct. 17, 1911..	
C. G. Walker.....	Rodman "A".....	Dec. 1, 1911..	
A. T. Hilton.....	Rodman "A".....	Oct. 3, 1911..	
J. P. Joynes.....	Rodman "A".....	June 12, 1911..	
C. D. Cann.....	Rodman "A".....	June 14, 1912..	
Ray F. Gildea.....	Rodman "A".....	Aug. 1, 1912..	
F. L. Maier.....	Rodman "A".....	June 24, 1912..	Resigned Aug. 26, 1913.
Joseph P. McCafferty.....	Rodman "A".....	June 24, 1912..	
Thomas G. Stowe.....	Rodman "A".....	Feb. 19, 1912..	
Charles E. Woollen.....	Rodman "A".....	April 25, 1913..	
A. W. Fuchs.....	Rodman "A".....	June 24, 1913..	
J. P. Bonner.....	Rodman "A".....	Aug. 15, 1913..	
R. E. L. Williams.....	Rodman "A".....	April 2, 1913..	
E. H. Compton.....	Rodman "A".....	May 3, 1913..	
H. R. McCauley.....	Rodman "A".....	May 16, 1913..	
A. J. Kutzleb.....	Rodman "A".....	June 16, 1913..	

TABLE No. 1—Continued.
PERSONNEL OF CHIEF ENGINEER'S STAFF.

NAME.	TITLE.	ENTERED SERVICE.	REMARKS.
H. Reid Treiber.....	Rodman "A".....	Feb. 5, 1912.....	Promoted from Rodman "B" Aug. 1, 1913
Charles T. Wanzer.....	Rodman "A".....	June 27, 1913.....	
Alan F. Bristor.....	Rodman "B".....	Oct. 10, 1912.....	
Chauncey Brooks.....	Rodman "B".....	April 24, 1912.....	
M. E. Gerlach.....	Rodman "B".....	May 28, 1912.....	
C. W. Hook.....	Rodman "B".....	April 4, 1912.....	
James H. McKay.....	Rodman "B".....	Mar. 14, 1912.....	Resigned July 1, 1913.
William T. Snyder.....	Rodman "B".....	Mar. 28, 1912.....	Resigned Jan. 1, 1913.
Guy C. Sykes.....	Rodman "B".....	May 22, 1912.....	
E. S. Trine.....	Rodman "B".....	Nov. 14, 1912.....	
Otis G. Wilbur.....	Rodman "B".....	Nov. 18, 1912.....	Resigned April 30, 1913.
Oscar R. Willey.....	Rodman "B".....	May 27, 1912.....	Dropped June 15, 1913.
Howard Wilds.....	Rodman "B".....	June 20, 1913.....	Resigned Dec. 31, 1913.
M. E. Davis.....	Rodman "B".....	July 7, 1913.....	
C. W. Miller.....	Rodman "B".....	July 10, 1913.....	
F. B. Beacham.....	Rodman "B".....	July 7, 1913.....	
W. O. Towson.....	Rodman "B".....	Sept. 17, 1913.....	
Leo Blankman.....	Rodman "B".....	July 28, 1913.....	
Robert W. Downes.....	Rodman "B".....	Sept. 11, 1913.....	
George E. Harris, Jr.....	Rodman "B".....	April 17, 1913.....	
Rollins Alexander.....	Rodman "B".....	July 24, 1913.....	
C. E. Reynolds.....	Rodman "B".....	Sept. 9, 1913.....	
George J. Arneling.....	Engineer of Tests.....	Aug. 8, 1907.....	Transferred from Chemist Jan. 1, 1913.
W. H. Streeter.....	Chemist and Bact.....	Jan. 2, 1913.....	
T. R. Schoonmaker.....	Asst. Chemist.....	June 20, 1912.....	Transferred from Rodman "A" April 1, 1913

TABLE No. 1—*Concluded.*

PERSONNEL OF CHIEF ENGINEER'S STAFF.

NAME.	TITLE.	ENTERED SERVICE.	REMARKS.
M. H. Melvin.....	Cement Tester.....	June 27, 1912..	Transferred from Rodman "A" Jan. 1, 1913.
Norman Byrd.....	Asst. Cement Tester.....	Feb. 1, 1913..	
C. F. Kracter.....	Cement Sampler.....	Sept. 20, 1906..	
Robert Piggott.....	Asst. Cement Sampler.....	Mar. 18, 1912..	Transferred from Rodman "A" Jan. 1, 1913.
Charles H. Brooks.....	Asst. Cement Sampler.....	Nov. 16, 1907..	Transferred from Rodman "B" Jan. 1, 1913.
R. N. Brooks.....	Asst. Cement Sampler.....	May 1, 1913..	Transferred from Rodman "B" Jan. 1, 1913.
Urban Preller.....	Asst. Cement Sampler.....	June 1, 1912..	
H. N. O'Brien.....	Laboratory Assistant.....	Oct. 11, 1907..	
Cloyd S. Weaver.....	Supt. Day Labor.....	Jan. 2, 1912..	Resigned April 1, 1913.
S. Robert Martin.....	Stenographer "A".....	Feb. 10, 1912..	Promoted from Stenog. "B" July 15, 1913.
Robert F. Windfohr.....	Stenographer "A".....	Oct. 28, 1912..	Promoted from Stenog. "B" July 15, 1913.
J. L. Pennington.....	Stenographer "B".....	July 23, 1909..	Resigned Oct. 1, 1913.
George F. Bayliss.....	Stenographer "B".....	Feb. 5, 1912..	Resigned Mar. 23, 1913.
Edison M. Hughes.....	Stenographer "B".....	Feb. 1, 1912..	
George W. Schmitt ger.....	Stenographer "B".....	Oct. 1, 1913..	
G. L. Hughes.....	Stenographer "B".....	Sept. 5, 1913..	
J. E. Freeman.....	Stenographer "B".....	Sept. 8, 1913..	
J. F. Drenberger.....	Stenographer "B".....	April 7, 1913..	
C. Milton Stapl.....	Stenographer "B".....	Aug. 11, 1913..	Resigned Sept. 1, 1913.
M. H. Frank.....	File Clerk.....	Jan. 25, 1912..	
William C. Higgins.....	Clerk.....	Oct. 3, 1912..	
M. J. Kerr.....	Clerk.....	Feb. 3, 1913..	
Kenneth M. Burns.....	Clerk.....	May 16, 1913..	

TABLE No. 2.
STATEMENT OF CONTRACTS LET PRIOR TO 1913.

CONTRACT.	DATE OF CONTRACT.	NAME OF CONTRACTOR.	PROPORTION OF WORK COMPLETED DECEMBER 31, 1913.
Wash Borings No. 1.....	July 2, 1906.	B. F. Smith & Bro.....	Completed July 28, 1906.
Testing Plant.....	Oct. 17, 1906.	Malcolm W. Hill Co.....	Completed July 1, 1907.
Laboratory.....	Oct. 18, 1906.	Wm. Kirkpatrick.....	Completed Feb. 1, 1907.
Storm Water No. 1.....	Oct. 18, 1906.	M. A. Talbott Co.....	Completed April 14, 1908.
Sanitary Sewers—Walbrook.....	Oct. 20, 1906.	M. A. Talbott Co.....	Completed June 27, 1907.
Outfall Sewer, Section No. 1.....	Dec. 7, 1906.	M. A. Talbott Co.....	Completed August 1, 1909.
Outfall Sewer, Section No. 2.....	Dec. 7, 1906.	M. A. Talbott Co.....	Completed August 6, 1908.
Sewage Pumping Plant Machinery.	Dec. 12, 1906.	Bethlehem Steel Co.....	Completed Feb. 18, 1913.
West Low Level Interceptor, Section No. 1.....	May 1, 1907.	Metropolitan Contr. Co.	Completed March 26, 1908.
West Low Level Interceptor, Section No. 2.....	May 1, 1907.	Metropolitan Contr. Co.	Completed March 26, 1908.
Outfall Sewer, Section No. 3.....	May 4, 1907.	J. Connelly Const. Co.....	Completed June 7, 1909.
Outfall Sewer, Section No. 7.....	May 4, 1907.	J. Connelly Const. Co.....	Completed Dec. 19, 1908.
Outfall Sewer, Section No. 8.....	May 4, 1907.	J. Connelly Const. Co.....	Completed Nov. 1, 1908.
Outfall Sewer, Section No. 9.....	May 4, 1907.	A. F. Helm.....	Completed Oct. 13, 1908.
Outfall Sewer, Section No. 6.....	May 28, 1907.	David Peoples.....	Completed Oct. 16, 1908.
Storm-Water No. 2.....	May 28, 1907.	David Peoples.....	Completed May 11, 1909.
Storm-Water No. 3.....	May 28, 1907.	David Peoples.....	Completed May 15, 1909.
High Level Interceptor, Section No. 1.....	May 29, 1907.	M. A. Talbott Co.....	Completed Nov. 5, 1908.
High Level Interceptor, Section No. 2.....	May 29, 1907.	M. A. Talbott Co.....	Completed May 1, 1909.

TABLE No. 2—*Continued.*
STATEMENT OF CONTRACTS LET PRIOR TO 1913.

CONTRACT.	DATE OF CONTRACT.	NAME OF CONTRACTOR.	PROPORTION OF WORK COMPLETED DECEMBER 31, 1913.
Outfall Sewer, Section No. 4.	May 29, 1907.	M. A. Talbott Co.	Completed March 17, 1909.
Outfall Sewer, Section No. 5.	May 29, 1907.	M. A. Talbott Co.	Completed August 1, 1909.
Outfall Sewer, Section No. 10.	June 10, 1907.	J. Connelly Const. Co.	Completed Nov. 1, 1908.
	NOTE.—This contract was first awarded to J. Erwin Hillpot, but he was unable to furnish satisfactory bond and the contract was reawarded to the J. Connelly Construction Company, the next lowest bidder.		
Sewage Disposal Plant, Clearing and Grubbing Disposal Area	July 8, 1907.	Lane Bros. Co. & Jones..	Completed Sept. 1, 1909.
	NOTE.—This contract was awarded on April 24 to J. Erwin Hillpot, but he was unable to furnish a satisfactory bond and the work was readvertised.		
Digging Test Well on site of Sewage Pumping Station....	July 29, 1907.	Metropolitan Contr. Co.	Completed August 27, 1907.

TABLE No. 2—*Continued*.
STATEMENT OF CONTRACTS LET PRIOR TO 1913.

CONTRACT.	DATE OF CONTRACT.	NAME OF CONTRACTOR.	PROPORTION OF WORK COMPLETED DECEMBER 31, 1913.
West Low Level Interceptor, Section No. 3.....	Feb. 28, 1908.	Metropolitan Contr. Co.	Completed Oct. 30, 1908.
East Low Level Interceptor, Section No. 1.....	May 8, 1908.	T. J. O'Connell.....	Completed May 15, 1909.
East Low Level Interceptor, Section No. 2.....	May 8, 1908.	T. J. O'Connell.....	Completed May 15, 1909.
Grading Manderson lot.....	May 8, 1908.	Gustavus Keckel.....	Completed June 29, 1908.
Sewage Pumping Station, Superstructure.....	May 9, 1908.	Noel Construction Co..	
Sewage Pumping Station, Substructure.....	May 9, 1908.	Noel Construction Co..	Completed August 1, 1911.
Storm Water Contract No. 4..	June 17, 1908.	Reilly & Kiddle.....	Completed March 16, 1909.
Roadway, Willis avenue.....	Aug. 7, 1908.	L. B. McCabe.....	Completed Nov. 30, 1908.
Storm Water Contract No. 5..	Sept. 17, 1908.	David Peoples	Completed Jan. 23, 1909.
Roadways on Baltimore Brick Company's property	Sept. 28, 1908.	Thos. Mullin	Completed Dec. 7, 1908.
West Low Level Interceptor, Section No. 4.....	Oct. 28, 1908.	Metropolitan Contr. Co.	Completed July 10, 1909.
Force Main	Nov. 2, 1908.	Warren F. Brenizer Co.	Completed Oct. 12, 1909.
Force Main Sewer	Nov. 4, 1908.	Ryan & Reilly	Completed Sept. 30, 1909.
Sewage Disposal Plant.....	Nov. 4, 1908.	New York Continental Jewell Filtration Co..	Completed Dec. 23, 1910.
Storm Water Contract No. 6..	Dec. 31, 1908.	Booth & Flinn.....	Completed Jan. 28, 1910.

TABLE No. 2—Continued.
STATEMENT OF CONTRACTS LET PRIOR TO 1913.

CONTRACT.	DATE OF CONTRACT.	NAME OF CONTRACTOR.	PROPORTION OF WORK COMPLETED DECEMBER 31, 1913.
Filter Stone for Sewage Disposal Plant.....	Dec. 31, 1908.	Fisher & Carozza.....	Completed June 1, 1911.
Sanitary Contract No. 35, Lat-eral Sewers, District No. 26.	Mar. 6, 1909.	T. Wallace Reilly.....	Completed Oct. 7, 1909.
Sanitary Contract No. 37, Sewage Disposal Plant, Water Tanks and Tower.....	Feb. 19, 1909.	Horace E. Horton (Chicago Bridge and Iron Works).....	Completed Sept. 1, 1909.
Sanitary Contract No. 38, Lat-eral Sewers, District No. 28.	April 10, 1909.	Ryan & Reilly.....	Completed Nov. 10, 1909.
Sanitary Contract No. 39, Lat-eral Sewers, District No. 30.	April 15, 1909.	James Ferry & Sons.....	Completed Sept. 25, 1909.
Sanitary Contract No. 40, Forest Park Sewage Disposal Works.....	Sept. 15, 1909.	Lane Bros. Co. & Jones.	Completed Oct. 25, 1910.
Sanitary Contract No. 41, Trunk Sewers, District No. 48.	Sept. 10, 1909.	T. Wallace Reilly.....	Contract abandoned June 15, 1910. 72% of work completed.
Sanitary Contract No. 42, Jones Falls Interceptor, Section No. 1.	Sept. 22, 1909.	M. A. Talbott Co. ...	Completed Oct. 15, 1910.
Sanitary Contract No. 43, Lat-eral Sewers, District No. 29.	Sept. 11, 1909.	Wm. McCarthy & Co. .	Completed April 25, 1910.

TABLE No. 2—*Continued*
STATEMENT OF CONTRACTS LET PRIOR TO 1913.

CONTRACT.	DATE OF CONTRACT.	NAME OF CONTRACTOR.	PROPORTION OF WORK COMPLETED DECEMBER 31, 1913.
Sanitary Contract No. 44, Lat- eral Sewers, District No. 21.	Dec. 18, 1909.	David Peoples.....	Completed Aug. 15, 1910.
Sanitary Contract No. 45, Lat- eral Sewers, District No. 27.	Dec. 18, 1909.	David Peoples.....	Completed Aug. 8, 1910.
Storm Water Contract No. 7.	June 2, 1909.	Wm. McCarthy & Co....	Completed Dec. 31, 1909.
Storm Water Contract No. 8.	Sept. 11, 1909.	M. O'Herron & Co.....	Completed Dec. 31, 1909.
Sanitary Contract No. 46, Power-house, Pump House and Land Conduits, Sewage Disposal Plant.....	Feb. 21, 1910.	Eyan & Reilly.....	Completed April 1, 1911.
Sanitary Contract No. 47, Underwater Discharge Con- duits, Sewage Disposal Plant.	Mar. 10, 1910.	B. F. Sweeten & Son.	Completed Dec. 2, 1911.
Sanitary Contract No. 48, Lat- eral Sewers, District 19-B.	Feb. 28, 1910.	Irwin Brothers.....	Completed Oct. 15, 1910.
Sanitary Contract No. 49, Lat- eral Sewers, District No. 35.	Feb. 28, 1910.	Irwin Brothers.....	Completed Aug. 12, 1910.
Sanitary Contract No. 50, Jones Falls Interceptor, Sec. No. 2.	May 20, 1910.	United Engineering & Construction Co.....	Completed May 18, 1911.
Sanitary Contract No. 51, Elec- trical and Mechanical Equip- ment, Sewage Disposal Plant.	May 21, 1910.	McCay Engineering Co	Completed Feb. 20, 1912

TABLE No. 2 -Continued.
STATEMENT OF CONTRACTS LET PRIOR TO 1913.

CONTRACT.	DATE OF CONTRACT.	NAME OF CONTRACTOR.	PROPORTION OF WORK COMPLETED DECEMBER 31, 1913.
Sanitary Contract No. 52, Lat- eral Sewers, District No. 19- A, etc.....	June 9, 1910	Wm. McCarthy & Co...	Completed June 16, 1911.
Sanitary Contract No. 53, Lat- eral Sewers, District No. 25, etc.....	June 23, 1910.	D. V. Ault & Co.....	Completed Jan. 16, 1911.
Sanitary Contract No. 54, Trunk Sewers, District No. 48*....	July 28, 1910.	W. H. & C. F. Thomp- son.....	Completed Mar. 10, 1911.
Sanitary Contract No. 55, Lat- eral Sewers, District No. 14.	Sept. 16, 1910.	B. F. Sweeten & Son..	Completed April 12, 1911.
Sanitary Contract No. 56, Coal and Ash Conveying Plant, Sewage Pumping Station....	Sept. 20, 1910.	Dietz Engineering Co..	Completed March 1, 1913.
Sanitary Contract No. 57, Lat- eral Sewers, District No. 34- A.....	Nov. 10, 1910.	Whiting-Middleton Con- struction Co.....	Completed July 14, 1911.
Sanitary Contract No. 58, Mc- Mehen Street Interceptor..	Nov. 23, 1910.	McCay Engineering Co.	Completed April 3, 1911.
Sanitary Contract No. 59, Elec- tric Wiring, Sewage Pump- ing Station.....	Dec. 16, 1910.	Central Electric Co....	Completed June 26, 1912.
Storm Water Contract No. 9..	Mar. 26, 1910.	David Peoples.....	Completed June 27, 1911.
Storm Water Contract No. 10.	June 20, 1910.	George F. Beavin	Completed Dec. 24, 1910.

*Completion of work originally included in Contract No. 41.

TABLE No. 2—Continued.
STATEMENT OF CONTRACTS LET PRIOR TO 1913.

CONTRACT.	DATE OF CONTRACT.	NAME OF CONTRACTOR.	PROPORTION OF WORK COMPLETED DECEMBER 31, 1913.
Sanitary Contract No. 60, Sewage Disposal Plant Laboratory Building.....	June 3, 1911.	D. M. Andrew Co.....	Completed April 1, 1912.
Sanitary Contract No. 61, Lat-eral Sewers, District No. 40-C.....	Jan. 10, 1911.	B. F. Sweeten & Son....	Completed Nov. 1, 1911.
Sanitary Contract No. 62, Pratt Street Trunk Sewer.....	Mar. 9, 1911.	McCay Engineering Co..	Completed Dec. 18, 1911.
Sanitary Contract No. 63, Lat-eral Sewers, District No. 15..	Mar. 11, 1911.	Wm. McCarthy & Co....	Completed Nov. 2, 1911.
Sanitary Contract No. 64, Sewage Pumping Station, Water-piping and Steam Heating...	Mar. 6, 1911.	Wanner Steam and Hot Water Heating Co....	Completed Mar. 31, 1912.
Sanitary Contract No. 65, Sewage Disposal Plant, Sewage Screens .....	.....	.....	Bids rejected.
Sanitary Contract No. 66, Lat-eral Sewers, District No. 36-A.....	June 15, 1911.	B. F. Sweeten & Son....	Completed Mar. 1, 1912.
Sanitary Contract No. 67, Sewage Pumping Station, Junction Sewer	June 8, 1911.	Martin J. Beach.....	Completed Dec. 30, 1911.
Sanitary Contract No. 68, Sewage Disposal Plant, Nozzles for Sprinkling Filters.....	Aug. 21, 1911.	Merritt & Co.....	Completed Jan. 10, 1912.

TABLE No. 2—Continued.

STATEMENT OF CONTRACTS LET PRIOR TO 1913.

CONTRACT.	DATE OF CONTRACT.	NAME OF CONTRACTOR.	PROPORTION OF WORK COMPLETED DECEMBER 31, 1913.
Sanitary Contract No. 69, Fixed Screens at Sewage Disposal Works and Sewage Pumping Station.....	July 27, 1911.	H. S. Roberts.....	Completed Feb. 20, 1912.
Sanitary Contract No. 70, Sewage Disposal Plant, Pier over Discharge Pipes.....	.....	.....	Withdrawn.
Sanitary Contract No. 71, Lat-eral Sewer in Alley West of Park Heights Avenue, north of Fifth Avenue.....	Aug. 9, 1911.	G. R. Abbott.....	Completed Sept. 30, 1911.
Sanitary Contract No. 72, Sewage Pumping Plant, Discharge Piping and Valves...	Aug. 17, 1911.	B. F. Sweeten & Son....	Completed Nov. 1, 1912.
Sanitary Contract No. 73, Sewage Pumping Station, Electric Generators and Switchboards.....	Sept. 18, 1911.	Thos. C. Basshor Co....	90 per cent.
Sanitary Contract No. 74, Lat-eral Sewers, District No. 20-B.....	Sept. 22, 1911.	B. F. Sweeten & Son....	Completed Jan. 4, 1913
Sanitary Contract No. 75, High Level Interceptor, Section No. 4.....	Sept. 25, 1911.	W. H. & C. F. Thompson.....	Completed Nov. 18, 1912.

TABLE No. 2—*Continued.*
STATEMENT OF CONTRACTS LET PRIOR TO 1913.

CONTRACT.	DATE OF CONTRACT.	NAME OF CONTRACTOR.	PROPORTION OF WORK COMPLETED DECEMBER 31, 1913.
Sanitary Contract No. 76, Lat- eral Sewer in Alley east of Park Heights Avenue, be- tween Third and Fifth Ave- nues.....	Sept. 25, 1911.	W. H. & C. F. Thomp- son.....	Completed Nov. 3, 1911.
Sanitary Contract No. 77, Sew- age Disposal Plant, Revolv- ing Screens.....	Nov. 10, 1911.	D'Olier Engineering Co.	Completed April 30, 1912.
Storm Water Contract No. 11.	Jan. 13, 1911.	Wm. McCarthy & Co....	Completed May 4, 1911.
Storm Water Contract No. 12.	Mar. 30, 1911.	C. B. Clark & Co.....	Completed April 10, 1912.
Storm Water Contract No. 13.	Sept. 22, 1911.	Ryan & Reilly.....	Completed Sept. 2, 1912.
Storm Water Contract No. 14, Jones Falls Conduits, Section No. 1.....	July 10, 1911.	M. M. Elkan.....	Completed July 1, 1913.
Storm Water Contract No. 15.	Sept. 9, 1911.	Martin J. Beach.....	Completed Nov. 2, 1911.
Storm Water Contract No. 16, Jones Falls Conduits, Section No. 2.....	Nov. 6, 1911.	Fisher & Carozza.....	Completed December 6, 1913.
Sanitary Contract No. 78, Lateral Sewers, District No.	Jan. 3, 1912.	Wm. McCarthy & Co....	Completed Nov. 19, 1912.
Sanitary Contract No. 79, Sanitary Sewers in Frederick Road	Feb. 16, 1912.	Martin J. Beach.....	Completed Aug. 11, 1912.

TABLE No. 2—*Continued.*
STATEMENT OF CONTRACTS LET PRIOR TO 1913.

CONTRACT.	DATE OF CONTRACT.	NAME OF CONTRACTOR.	PORTION OF WORK COMPLETED DECEMBER 31, 1913.
Sanitary Contract No. 80, Lat- eral Sewers at Bay View Asylum	Feb. 2, 1912.	Bond & Bates.....	Completed Sept. 10, 1912.
Sanitary Contract No. 81, High Level Interceptor, Section No. 5.....	Feb. 23, 1912.	Ryan & Reilly.....	Completed Feb. 1, 1913.
Sanitary Contract No. 82, House Connections Across Footways in Districts Nos. 25, 27, 28, 34-A and 35.....	Jan. 3, 1912.	Wm. McCarthy & Co....	Completed July 31, 1912.
Sanitary Contract No. 83, Nozzles for Sprinkling Beds Nos. 3 and 4.....	Feb. 3, 1912.	Pacific Flush Tank Co....	Completed April 20, 1912.
Sanitary Contract No. 84, Lat- eral Sewers in Light and Gay Streets	Feb. 23, 1912	Ryan & Reilly.....	Completed April 30, 1912.
Sanitary Contract No. 85, House Connections, District No. 14.....	Feb. 20, 1912.	Gallagher, Boyle & Muller	Completed July 3, 1912.
Sanitary Contract No. 86, Lat- eral Sewers in District No. 17.....	Apr. 15, 1912.	B. F. Sweeten & Son....	Completed Feb. 8, 1913.

TABLE No. 2—Continued.
STATEMENT OF CONTRACTS LET PRIOR TO 1913.

CONTRACT.	DATE OF CONTRACT.	NAME OF CONTRACTOR.	PORTION OF WORK COMPLETED DECEMBER 31, 1913.
Sanitary Contract No. 87, Lateral Sewers in District No. 18.....	May 1, 1912.	B. F. Sweeten & Son....	Completed July 12, 1913.
Sanitary Contract No. 88, Lateral Sewers in District No. 40-B	May 2, 1912.	Jas. Ferry & Sons.....	Completed Feb. 1, 1913.
Sanitary Contract No. 89, High Level Interceptor, Section No. 3.....	May 31, 1912.	H. C. Brooks & Co.....	Completed April 18, 1913.
Sanitary Contract No. 90, Miscellaneous Lateral Sewers.....	June 7, 1912.	Ryan & Reilly.....	Completed Dec. 2, 1912.
Sanitary Contract No. 91, Macadam Roadway at Back River	July 12, 1912.	Carozza & Lavezza.....	Completed Oct. 22, 1912.
Sanitary Contract No. 92, House Connections Across Footways in District No. 15..	June 21, 1912.	Gallagher, Boyle & Muller	Completed Oct. 15, 1912.
Sanitary Contract No. 93, House Connections Across Footways in Districts Nos. 29 and 30.....	July 16, 1912.	Wm. McCarthy & Co....	Completed Jan. 2, 1913.
Sanitary Contract No. 94, Miscellaneous Lateral Sewers No. 2.....	Aug. 17, 1912.	Gallagher, Boyle & Bryan	Completed Feb. 15, 1913.

TABLE No. 2—Continued.

STATEMENT OF CONTRACTS LET PRIOR TO 1913.

CONTRACT.	DATE OF CONTRACT.	NAME OF CONTRACTOR.	PORTION OF WORK COMPLETED DECEMBER 31, 1913.
Sanitary Contract No. 95, High Level Interceptor, Section No. 6.....	Aug. 6, 1912.	Ryan & Reilly.....	Completed May 1, 1913.
Sanitary Contract No. 96, Digging Ditches at Back River.....	.....	.....	Bids rejected.
Sanitary Contract No. 97, Miscellaneous Lateral Sewers No. 3.....	Sept. 7, 1912.	Gallagher Boyle & Bryan	Completed Feb. 22, 1913.
Sanitary Contract No. 98, House Connections Across Footways in District No. 26.	Sept. 27, 1912.	Jas. Ferry & Sons.....	Completed Feb. 1, 1913.
Sanitary Contract No. 99, House Connections Across Footways in District No. 10-B.....	Sept. 27, 1912.	Wm. McCarthy & Co....	Completed Jan. 15, 1913.
Sanitary Contract No. 100, Sprinkling Filters, Disposal Plant.....	Oct. 10, 1912.	Lane Bros. Co.....	94 per cent.
Sanitary Contract No. 101, Broken Stone, Sewage Disposal Plant.....	Oct. 3, 1912.	Standard Lime & Stone Co.	26 per cent.
Sanitary Contract No. 102, High Level Interceptor, Section No. 7.....	Oct. 16, 1912.	C. B. Clark & Co.....	Completed Sept. 29, 1913.

TABLE No. 2—*Concluded.*

STATEMENT OF CONTRACTS LET PRIOR TO 1913.

CONTRACT.	DATE OF CONTRACT.	NAME OF CONTRACTOR.	PORTION OF WORK COMPLETED DECEMBER 31, 1913.
Sanitary Contract No. 103, Locust Point Trunk Sewer, Section No. 1.....	Oct. 16, 1912.	Ryan & Reilly.....	Completed May 5, 1913.
Sanitary Contract No. 104, Lateral Sewers, District No. 40-A.....	Nov. 6, 1912.	Wm. McCarthy & Co....	Completed June 2, 1913.
Sanitary Contract No. 105, House Connections Across Footways in Districts Nos. 36-A and 40-C.....	Nov. 30, 1912.	Carozza & Lavezza.....	Completed Mar. 10, 1913.
Sanitary Contract No. 106, House Connections in Districts No. 19-A and 21-A....	Dec. 30, 1912.	Wm. McCarthy & Co....	Completed May 16, 1913.
Storm-water Contract No. 17.	Jan. 2, 1912.	N. A. Middleton & Co..	Completed July 6, 1912.
Storm-water Contract No. 18.	Jan. 3, 1912.	Wm. McCarthy & Co....	Completed Sept. 29, 1912.
Storm-water Contract No. 19.	Mar. 18, 1912.	B. F. Sweeten & Son....	Completed Jan. 6, 1913.
Storm-water Contract No. 20.	Apr. 25, 1912.	Ryan & Reilly.....	Completed Nov. 1, 1912.
Storm-water Contract No. 21.	July 13, 1912.	C. B. Clark & Co.....	Completed April 2, 1913.
Storm-water Contract No. 22.	Oct. 8, 1912.	B. F. Sweeten & Son....	Completed Dec. 15, 1913.
Storm-water Contract No. 23.	Oct. 25, 1912.	Wm. McCarthy & Co....	Completed April 24, 1913.
Storm-water Contract No. 24.	Dec. 27, 1912.	B. F. Sweeten & Son....	Completed Dec. 15, 1913.
Storm-water Contract No. 25.	Dec. 31, 1912.	Jas. Ferry & Sons.....	Completed Dec. 17, 1913.

TABLE No. 2.
STATEMENT OF CONTRACTS LET DURING THE YEAR 1913, WITH PROPORTION OF WORK COMPLETED
DECEMBER 31.

CONTRACT.	NAME OF CONTRACTOR.	DATE OF CONTRACT.	PRINCIPAL ITEMS OF WORK.	LOWEST BID.	NEXT TO LOWEST BID.	PROPORTION OF WORK COMPLETED, DEC. 31, 1913.
Sanitary Contract No. 107, Lateral Sewers, District No. 8.	Frank Bruno & Co.	Feb. 18, 1913	31,450 lin. ft. 8" sewer. 2,805 lin. ft. 10" sewer. 2,230 lin. ft. 12" sewer. 690 lin. ft. 15" sewer. 315 lin. ft. 18" sewer. 660 lin. ft. 22" sewer. 810 lin. ft. 24" sewer. 350 lin. ft. 36" sewer. 135 cu. yds. excavation below sub-grade. 70 cu. yds. gravel refill below sub-grade. 195 cu. yds. concrete masonry. 4,000 lin. ft. 4" and 6" underdrain. 366 M. ft. B. M. sheeting, shoring, etc. 2,128 lin. ft. standard manholes. 242 manhole frames. 950 manhole steps. 48 drop-connections. 33,800 lin. ft. excavation for house-connections. 35,100 lin. ft. vitrified and cast-iron pipe house-connections. 2,613 branches. 350 lin. ft. vitrified standpipe. 24 lamphole frames and covers. 1,650 lin. ft. W. I. water supply pipe to manholes. 5,050 sq. ft. granolithic pavement relaid. 16,750 sq. ft. vitrified block and other pavement relaid	\$117,873.52	\$124,886.70	Completed Dec. 31, 1913.

TABLE No. 3—Continued.
STATEMENT OF CONTRACTS LET DURING THE YEAR 1913, WITH PROPORTION OF WORK COMPLETED
DECEMBER 31.

CONTRACT.	NAME OF CONTRACTOR.	DATE OF CONTRACT.	PRINCIPAL ITEMS OF WORK.	LOWEST BID.	NEXT TO LOWEST BID.	PROPORTION OF WORK COMPLETED DEC. 31, 1913.
Sanitary Contract No. 108, Miscellaneous Lateral Sewers No. 4.	W. H. Thompson Construction Company.	May 16, 1913	4,425 lin. ft. 8" sewer. 2,485 lin. ft. 10" sewer. 40 cu. yds. excavation below sub-grade. 530 cu. yds. rock excavation. 25 cu. yds. concrete masonry. 700 lin. ft. 4" and 6" underdrain. 72 M. ft. B. M. sheeting, shoring, etc. 320 lin. ft. manholes. 37 manhole frames and covers. 260 manhole steps. 1,850 lin. ft. excavation for house-connections. 2,100 lin. ft. vitrified and cast-iron pipe house-connections. 250 lin. ft. W. I. water supply pipe to manholes. 225 sq. ft. granolithic pavement relaid. 535 lin. ft. vitrified block and other pavement relaid.	\$17,006.20	\$19,080.45	Completed Nov. 14, 1913.

TABLE No. 3—Continued.
STATEMENT OF CONTRACTS LET DURING THE YEAR 1913, WITH PROPORTION OF WORK COMPLETED
DECEMBER 31.

CONTRACT.	NAME OF CONTRACTOR.	DATE OF CONTRACT.	PRINCIPAL ITEMS OF WORK.	Lowest Bid.	NEXT TO LOWEST BID.	PROPORTION OF WORK COMPLETED DEC. 31, 1913.
Sanitary Contract No. 109, Latera Sewers, District No. 41.	Carozza, La- vezza & Ca- rozza.	Mar. 11, 1913	26,100 lin. ft. 8" sewer. 390 lin. ft. 10" sewer. 1,100 lin. ft. 12" sewer. 490 lin. ft. 15" sewer. 210 lin. ft. 22" sewer. 880 lin. ft. 24" sewer. 100 cu. yds. excavation below sub-grade. 75 yds. rock excavation. 230 cu. yds. concrete masonry. 3,500 lin. ft. 4" and 6" underdrain. 366 M. ft. B. M. sheeting, shoring, etc. 1,600 lin. ft. manholes. 168 manhole frames and covers. 672 manhole steps. 21,600 lin. ft. excavation for house-connec- tions. 25,795 lin. ft. vitrified and cast-iron pipe house- connections. 1,320 branches. 400 lin. ft. vitrified standpipes. 1,000 lin. ft. W. I. water supply pipe to man- holes. 2,975 sq. ft. granolithic pavement relaid. 9,850 lin. ft. vitrified block and other pave- ment relaid.	\$22,697.65	\$94,242.00	Completed Dec. 1, 1913.

TABLE No. 3—*Continued.*
 STATEMENT OF CONTRACTS LET DURING THE YEAR 1913, WITH PROPORTION OF WORK COMPLETED
 DECEMBER 31.

CONTRACT.	NAME OF CONTRACTOR.	DATE OF CONTRACT.	PRINCIPAL ITEMS OF WORK.	LOWEST BID.	NEXT TO LOWEST BID.	PROPORTION OF WORK COMPLETED DEC. 31, 1913.
Sanitary Contract No. 110, Lateral Sewers, District No. 16-B.	McCarthy & O'Herron.	May 1, 1913	5,175 lin. ft. 8" sewer in trench, 3,800 lin. ft. 10" sewer in tunnel, 140 lin. ft. 12" sewer in tunnel, 390 lin. ft. 15" sewer in tunnel, 225 lin. ft. 18" sewer in tunnel, 50 cu. yds. rock excavation, 310 cu. yds. concrete masonry, 7,300 lin. ft. 4" and 6" underdrain, 1,080 M. ft. B. M. sheeting, shoring, etc. 1,480 lin. ft. manhole masonry, 118 manhole frames and covers, 750 manhole steps, 14,000 lin. ft. excavation for house-connections, 15,110 lin. ft. vitrified and cast-iron pipe house-connections, 685 branches, 625 lin. ft. W. I. water supply pipe to manholes, 2,450 sq. ft. granolithic pavement relaid, 4,050 lin. ft. vitrified block and other pavement relaid.	\$146,833.70	\$147,470.90	99 per cent.

TABLE No. 3—*Continued.*
STATEMENT OF CONTRACTS LET DURING THE YEAR 1913, WITH PROPORTION OF WORK COMPLETED
DECEMBER 31.

CONTRACT.	NAME OF CONTRACTOR.	DATE OF CONTRACT.	PRINCIPAL ITEMS OF WORK.	Lowest Bid.	NEXT TO LOWEST Bid.	PROPORTION OF WORK COMPLETED DEC. 31, 1913.
Sanitary Contract No. 111, Lateral Sewers District No. 16-A.	Middleton-Thompson Company.	June 3, 1913	2,585 lin. ft. 10" sewer in tunnel. 11,000 lin. ft. 10" sewer in trench. 1,155 lin. ft. 12" sewer in trench. 635 lin. ft. 12" sewer in trench. 1,000 lin. ft. 15" sewer in trench. 755 lin. ft. 18" sewer in trench. 160 lin. ft. 18" sewer in trench. 305 lin. ft. 20" sewer in trench. 420 lin. ft. 22" sewer in trench. 340 lin. ft. 22" sewer in trench. 50 cu. yds. rock excavation. 310 cu. yds. concrete masonry. 7,300 lin. ft. underdrain, 4" to 6". 915 M. ft. B. M. sheeting, shoring, etc. 1,400 lin. ft. manholes. 116 manhole frames and covers. 750 manhole steps. 13,900 lin. ft. excavation for house-connections. 14,530 lin. ft. vitrified and cast-iron pipe house-connections. 660 branches. 600 lin. ft. vitrified standpipe. 2,200 sq. ft. granolithic pavement relaid. 4,700 lin. ft. vitrified and other pavement relaid.	\$157,503.40	\$164,826.25	77 per cent.
Sanitary Contract No. 113, Paving Around Sewage Pumping Station	John Danini.	Aug. 8, 1913	642 lin. ft. concrete coping. 602 lin. ft. armored concrete curb. 35 cu. yds. concrete in retaining walls. 6,865 sq. ft. granolithic pavement.	\$1,998.11	\$2,090.31	Completed Oct. 7, 1913.

TABLE No. 3—Continued.
STATEMENT OF CONTRACTS LET DURING THE YEAR 1913, WITH PROPORTION OF WORK COMPLETED
DECEMBER 31.

CONTRACT.	NAME OF CONTRACTOR.	DATE OF CONTRACT.	PRINCIPAL ITEMS OF WORK.	LOWEST BID.	NEXT TO LOWEST BID.	PROPORTION OF WORK COMPLETED DEC. 31, 1913.
Sanitary Contract No. 114, High Level Interceptor, Section No. 8.	C. B. Clark & Co.	June 4, 1913	5,300 cu. yds. excavation in trench. 1,425 lin. ft. excavation in tunnel. 375 cu. yds. rock excavation in trench. 2,000 cu. yds. rock excavation in tunnel. 260 cu. yds. brick masonry. 1,335 cu. yds. concrete masonry. 2,000 lbs. twisted steel for reinforcement. 500 cu. yds. embankment. 335 M. ft. B. M. sheeting, shoring, etc. 400 lin. ft. excavation for house-connections. 510 lin. ft. vitrified and cast-iron pipe house-connections. 50 sq. ft. granolithic pavement relaid. 400 lin. ft. vitrified and other pavement relaid. 3,000 lin. ft. 6" and 8" underdrain.	\$100,162.40	\$107,963.05	85 per cent.
Sanitary Contract No. 115, House Connections Across Footways, District No. 20-B.	Carozza, Iavezza & Carozza.	June 2, 1913	29,610 lin. ft. excavation for house-connections. 30,785 lin. ft. vitrified and cast-iron pipe house-connections. 420 branches. 9 M. ft. B. M. sheeting, shoring, etc. 8,300 sq. ft. granolithic pavement relaid. 27,560 lin. ft. vitrified and other pavement relaid.	\$23,870.30	\$24,712.70	Completed Oct. 22, 1913.

TABLE No. 3—Continued.
STATEMENT OF CONTRACTS LET DURING THE YEAR 1913, WITH PROPORTION OF WORK COMPLETED
DECEMBER 31.

CONTRACT.	NAME OF CONTRACTOR.	DATE OF CONTRACT.	PRINCIPAL ITEMS OF WORK.	LOWEST BID.	NEXT TO LOWEST BID.	PROPORTION OF WORK COMPLETED DEC. 31, 1913.
Sanitary Contract No. 116, Lateral Sewers, District No. 22-B.	Gallagher, Boyle & Bryan.	June 19, 1913	44,250 lin. ft. 8" sewer. 2,550 lin. ft. 10" sewer. 2,600 lin. ft. 12" sewer. 1,100 lin. ft. 15" sewer. 75 cu. yds. rock excavation. 580 cu. yds. concrete masonry. 10,000 lin. ft. 4" and 6" underdrain. 930 M. ft. B. M. sheeting, shoring, etc. 2,650 lin. ft. manholes. 280 manhole frames and covers. 1,400 manhole steps. 53,325 lin. ft. excavation for house-connections. 53,865 lin. ft. vitrified and cast-iron pipe house-connections. 3,510 branches. 2,000 lin. ft. W. I. water supply pipe to manholes. 8,000 sq. ft. granolithic pavement relaid. 20,000 lin. ft. vitrified and other pavement relaid.	\$190,001.80	\$197,985.05	Completed Dec. 10, 1913.

TABLE No. 3—*Continued.*
 STATEMENT OF CONTRACTS LET DURING THE YEAR 1913, WITH PROPORTION OF WORK COMPLETED
 DECEMBER 31.

CONTRACT.	NAME OF CONTRACTOR.	DATE OF CONTRACT.	PRINCIPAL ITEMS OF WORK.	LOWEST BID.	NEXT TO LOWEST BID.	PROPORTION OF WORK COMPLETED DEC. 31, 1913.
Sanitary Contract No. 117, Miscellaneous Lateral Sewers.	W. H. Thompson Construction Company	July 18, 1913	12,000 lin. ft. 8" sewer. 2,110 lin. ft. 10" sewer. 20 cu. yds. rock excavation. 60 cu. yds. concrete masonry. 3,500 lin. ft. 4" to 6" underdrain. 233 M. ft. B. M. sheeting, shoring, etc. 1,100 lin. ft. manholes. 110 manhole covers. 550 manhole steps. 9,700 lin. ft. excavation for house-connections. 11,475 lin. ft. vitrified and cast-iron pipe house-connections. 740 branches. 500 lin. ft. W. I. water supply pipe to manholes. 4,500 sq. ft. granolithic pavement relaid. 10,000 lin. ft. vitrified and other pavement relaid.	\$51,183.75	\$51,605.25	99 per cent.

TABLE No. 3—Continued.

STATEMENT OF CONTRACTS LET DURING THE YEAR 1913, WITH PROPORTION OF WORK COMPLETED
DECEMBER 31.

CONTRACT.	NAME OF CONTRACTOR.	DATE OF CONTRACT.	PRINCIPAL ITEMS OF WORK.	Lowest Bid.	NEXT TO LOWEST BID.	PROPORTION OF WORK COMPLETED DEC. 31, 1913.
Sanitary Contract No. 118, Lateral Sewers, Districts Nos. 21-A and 22-A.	McCarthy & O'Herron.	Sept. 16, 1913	6,600 lin. ft. 8" sewer. 3,500 lin. ft. 10" sewer. 1,400 lin. ft. 12" sewer. 1,150 lin. ft. 16" sewer. 25 cu. yds. rock excavation. 180 cu. yds. concrete masonry. 6,000 lin. ft. 4" to 6" underdrain. 420 M. ft. B. M. Sheeting, shoring, etc. 600 lin. ft. manholes. 60 manhole frames and covers. 350 manhole steps. 12,200 lin. ft. excavation for house-connections. 13,750 lin. ft. vitrified and cast-iron pipe house-connections. 700 branches. 500 lin. ft. W. I. water supply pipe to manholes. 2,500 sq. ft. granolithic pavement relaid. 6,000 lin. ft. vitrified and other pavement relaid. 3 flush tanks.	\$76,079.70	\$84,748.50	99 per cent.

TABLE No. 3—*Continued.*
 STATEMENT OF CONTRACTS LET DURING THE YEAR 1913, WITH PROPORTION OF WORK COMPLETED
 DECEMBER 31.

CONTRACT.	NAME OF CONTRACTOR.	DATE OF CONTRACT.	PRINCIPAL ITEMS OF WORK.	LOWEST BID.	NEXT TO LOWEST BID.	PROPORTION OF WORK COMPLETED DEC. 31, 1913.
Sanitary Contract No. 119, Lateral Sewers, District No. 44-A.	Gallagher, Boyle & Bryan.	Dec. 2, 1913	45,000 lin. ft. 8" sewer. 2,525 lin. ft. 10" sewer. 850 lin. ft. 12" sewer. 1,225 lin. ft. 18" sewer. 1,525 lin. ft. 20" sewer. 775 lin. ft. 22" sewer. 550 lin. ft. 24" sewer. 25 cu. yds. rock excavation. 600 cu. yds. concrete masonry. 11,000 lin. ft. 4" and 6" underdrain. 840 M. ft. B. M. sheeting, shoring, etc. 2,000 lin. ft. manholes. 335 manhole frames and covers. 1,675 manhole steps. 34,300 lin. ft. excavation for house-connections. 34,975 lin. ft. vitrified and cast-iron pipe house-connections. 3,230 branches. 2,300 lin. ft. W. I. water supply pipe to manholes. 6,000 sq. ft. granolithic pavement relaid. 13,500 lin. ft. vitrified and other pavement relaid.	\$176,154.75	\$180,017.90	10 per cent.

TABLE No. 3—Continued.
STATEMENT OF CONTRACTS LET DURING THE YEAR 1913, WITH PROPORTION OF WORK COMPLETED
DECEMBER 31.

CONTRACT.	NAME OF CONTRACTOR.	DATE OF CONTRACT.	PRINCIPAL ITEMS OF WORK.	LOWEST BID.	NEXT TO LOWEST BID.	PROPORTION OF WORK COMPLETED DEC. 31, 1913.
Sanitary Contract No. 120, Locust Point Trunk Sewer, Section No. 2.	Whiting-Turner Construction Co.	Oct. 16, 1913	3,500 lin. ft. 30" sewer. 60 cu. yds. concrete masonry. 3,500 lin. ft. 4" to 6" underdrain. 415 M. ft. B. M. sheeting, shoring, etc. 1,500 lin. ft. piles. 220 lin. ft. manholes. 13 manhole frames and covers. 90 manhole steps. 1,650 lin. ft. excavation for house-connections. 1,790 lin. ft. vitrified and cast-iron pipe house-connections. 100 sq. ft. granolithic pavement relaid. 100 lin. ft. vitrified and other pavement relaid.	\$55,947.50	\$57,582.50	2 per cent.

TABLE No. 3—Continued.
STATEMENT OF CONTRACTS LET DURING THE YEAR 1913, WITH PROPORTION OF WORK COMPLETED
DECEMBER 31.

CONTRACT.	NAME OF CONTRACTOR.	DATE OF CONTRACT.	PRINCIPAL ITEMS OF WORK.	LOWEST BID.	NEXT TO LOWEST BID.	PROPORTION OF WORK COMPLETED Dec. 31, 1913.
Sanitary Contract No. 121, Miscellaneous Lateral Sewers No. 6.	Whiting-Turner Construction Co.	Oct 8, 1913	8,925 lin. ft. 8" sewer. 3,900 lin. ft. 10" sewer. 1,550 lin. ft. 12" sewer. 510 lin. ft. 15" sewer. 20 cu. yds. rock excavation. 60 cu. yds. concrete masonry. 4,000 lin. ft. 4" to 6" underdrain. 258 M. ft. B. M. sheeting, shoring, etc. 850 lin. ft. standard manholes. 80 manhole frames and covers. 375 manhole steps. 15,100 lin. ft. excavation for house-connections. 15,600 lin. ft. vitrified and cast-iron pipe house-connections. 645 branches. 3,000 sq. ft. granolithic pavement relaid. 7,000 lin. ft. vitrified block and other pavement relaid.	\$65,868.50	\$74,615.00	99 per cent.
Sanitary Contract No. 122, High Level Interceptor. Section No. 9.	James Ferry & Sons.	Dec. 8, 1913	6,934 cu. yds. earth excavation. 2,397 cu. yds. rock excavation. 225 branches. 100 cu. yds. concrete masonry. 1,000 lbs. reinforcing steel. 3,100 cu. yds. embankment. 3,100 lin. ft. 6" and 8" underdrain. 150 M. ft. B. M. sheeting, shoring, etc. 28 manhole frames and covers. 140 manhole steps. 200 lin. ft. house-connections.	\$52,426.90	\$53,718.23	None.

TABLE No. 3—Continued.

STATEMENT OF CONTRACTS LET DURING THE YEAR 1913, WITH PROPORTION OF WORK COMPLETED
DECEMBER 31.

CONTRACT.	NAME OF CONTRACTOR.	DATE OF CONTRACT.	PRINCIPAL ITEMS OF WORK.	LOWEST BID.	NEXT TO LOWEST BID.	PROPORTION OF WORK COMPLETED DEC. 31, 1913.
Sanitary Contract No. 123, Lateral Sewers, District No. 7.	.....	.....	.....	.....	.....	Bids rejected and readvertisement postponed.
Sanitary Contract No. 124, Lateral Sewers, District No. 42.	Carozza Bros. & Co.	Dec. 31, 1913	17,000 lin. ft. 8" sewer. 5,000 lin. ft. 10" sewer. 800 lin. ft. 12" sewer. 150 cu. yds. concrete masonry. 6,000 lin. ft. 4" and 6" underdrain. 410 M. ft. B. M. sheeting, shoring, etc. 1,350 lin. ft. manholes. 137 manhole frames and covers. 650 manhole steps. 12,800 lin. ft. excavation for house-connections. 13,775 lin. ft. vitrified and cast-iron pipe house-connections. 1,215 branches. 1,000 lin. ft. W. I. water supply pipe to manholes. 2,350 sq. ft. granolithic pavement relaid. 5,200 lin. ft. vitrified and other pavement relaid.	\$80,552.25	\$84,194.70	None.

TABLE No. 3—Continued

STATEMENT OF CONTRACTS LET DURING THE YEAR 1913, WITH PROPORTION OF WORK COMPLETED
DECEMBER 31.

CONTRACT.	NAME OF CONTRACTOR.	DATE OF CONTRACT.	PRINCIPAL ITEMS OF WORK.	LOWEST BID.	NEXT TO LOWEST BID.	PROPORTION OF WORK COMPLETED Dec. 31, 1913.
Storm-Water Contract No. 26.	McCarthy & O'Herron.	Apr. 14, 1913	3,305 lin. ft. 54"x36" to 78"x36" masonry drain. 11,585 lin. ft. 30" to 48" masonry drain. 335 lin. ft. 30" cast-iron pipe. 26,465 lin. ft. 12" to 24" T. C. pipe. 10,925 lin. ft. 12" to 18" inlet connections. 500 cu. yds. concrete masonry. 2,000 lbs. corrugated steel bars. 3,600 lbs. 6" to 12" "I" beams. 5,000 lin. ft. 4" to 8" underdrain. 560 M. ft. B. M. sheeting, shoring, etc. 1,500 lin. ft. piles. 600 cu. yds. rock excavation. 1,250 lin. ft. manholes. 220 manhole frames and covers. 1,200 manhole steps. 425 inlets.	\$241,247.45	\$250,874.05	Completed Dec. 15, 1913.
Storm-Water Contract No. 27.	Ryan & Reilly Company.	May 15, 1913	900 lin. ft. 30" masonry drain. 6,670 lin. ft. 12" to 24" T. C. pipe. 2,100 lin. ft. 12" to 18" inlet connections. 108 cu. yds. concrete masonry. 79 M. ft. B. M. sheeting, shoring, etc. 245 lin. ft. manholes. 200 cu. yds. rock excavation. 73 inlets.	\$29,025.05	\$30,320.60	Completed Nov. 6, 1913.

TABLE No. 3—Continued.

STATEMENT OF CONTRACTS LET DURING THE YEAR 1913, WITH PROPORTION OF WORK COMPLETED
DECEMBER 31.

CONTRACT.	NAME OF CONTRACTOR.	DATE OF CONTRACT.	PRINCIPAL ITEMS OF WORK.	LOWEST BID.	NEXT TO LOWEST BID.	PROPORTION OF WORK COMPLETED DEC. 31, 1913.
Storm-Water Contract No. 28.	Guild & Co.	June 24, 1913	1,550 cu. yds. excavation for 120"x108" man- sonry drain. 3,305 lin. ft. 30" to 36" masonry drain. 13,635 lin. ft. 12" to 24" T. C. pipe. 4,565 lin. ft. 12" to 18" inlet connections. 85 cu. yds. brick masonry. 1,250 cu. yds. concrete masonry. 700 lbs. reinforcing steel. 1,400 lin. ft. 4" to 8" underdrain. 289 M. ft. B. M. sheeting, shoring, etc. 1,850 cu. yds. embankment. 183 inlets.	\$83,718.10	\$84,081.30	88 per cent.
Storm-Water Contract No. 29.	Whiting-Turner Construction Co.	July 12, 1913	485 lin. ft. excavation for 108"x36" drain. 260 lin. ft. excavation for 60"x33" drain. 80 lin. ft. 12" to 18" inlet connections. 715 cu. yds. concrete masonry. 48,000 lbs. corrugated steel bars. 740 lin. ft. 6" to 8" underdrain. 20 M. ft. B. M. sheeting, shoring, etc.	\$12,262.00	\$14,830.50	Completed Dec. 1, 1913.

TABLE No. 3—Continued.
STATEMENT OF CONTRACTS LET DURING THE YEAR 1913, WITH PROPORTION OF WORK COMPLETED
DECEMBER 31.

CONTRACT.	NAME OF CONTRACTOR.	DATE OF CONTRACT.	PRINCIPAL ITEMS OF WORK.	LOWEST BID.	NEXT TO LOWEST BID.	PROPORTION OF WORK COMPLETED DEC. 31, 1913.
Storm-Water Contract No. 30.	McCarthy & O'Herron.	Sept. 16, 1913	18,310 cu. yds. excavation for 12"x24" to 87"x120" masonry drain. 1,310 lin. ft. 6" to 24" T. C. pipe. 530 cu. yds. brick masonry. 5,785 cu. yds. concrete masonry. 65,000 lbs. corrugated steel bars. 5,800 lin. ft. 4" to 8" underdrain. 4,000 cu. yds. rock excavation. 2,700 cu. yds. embankment.	\$93,916.75	\$106,421.50	40 per cent.
Storm-Water Contract No. 31.	Ryan & Reilly Company.	Oct. 18, 1913	1,105 lin. ft. 30" to 33" masonry drain. 5,335 lin. ft. 12" to 24" T. C. drain. 880 lin. ft. 12" to 15" inlet connections. 105 cu. yds. concrete masonry. 1,100 lin. ft. 4" to 6" underdrain. 80 M. ft. B. M. sheeting, shoring, etc. 100 cu. yds. rock excavation. 500 lbs. reinforcing steel.	\$26,542.90	\$28,075.84	74 per cent.

TABLE No. 3—*Concluded*.
 STATEMENT OF CONTRACTOR'S LET DURING THE YEAR 1913, WITH PROPORTION OF WORK COMPLETED
 DECEMBER 31.

CONTRACT.	NAME OF CONTRACTOR.	DATE OF CONTRACT.	PRINCIPAL ITEMS OF WORK.	LOWEST BID.	NEXT TO LOWEST BID.	PROPORTION OF WORK COMPLETED DEC. 31, 1913.
Storm-Water Contract No. 32.	Guild & Co.	Nov. 12, 1913	1,550 cu. yds. excavation for 78" drain. 1,760 lin. ft. 30" to 42" masonry drain. 1,320 lin. ft. 20" to 24" T. C. drain. 82 cu. yds. brick masonry. 730 cu. yds. concrete masonry. 1,000 lbs. reinforcing steel. 1,780 lin. ft. 4" to 8" underdrain. 150 cu. yds. rock excavation. 500 cu. yds. embankment.	\$26,805.20	\$27,697.70	55 per cent.
Storm-Water Contract No. 33.	Ryan & Reilly	Dec. 26, 1913	5,215 lin. ft. 30" to 50" x 30" masonry drain. 15,960 lin. ft. 15" to 24" T. C. drain. 3,750 lin. ft. 12" to 18" inlet connections. 410 cu. yds. concrete masonry. 2,400 lbs. reinforcing steel. 1,300 lin. ft. 4" to 8" underdrain. 205 M. ft. B. M. sheeting, shoring, etc. 50 cu. yds. rock excavation. 117 inlets.	\$92,103.20	\$93,664.00	None.

TABLE No. 4
LENGTHS OF SANITARY SEWERS OF THE VARIOUS SIZES AND MATERIALS CON-
STRUCTED TO DECEMBER 31, 1913.

SIZE AND SHAPE.	MATERIAL.	CONSTRUCTED PRIOR TO 1913. LINEAR FEET.	CONSTRUCTED DURING 1913. LINEAR FEET.	CONSTRUCTED TO DEC. 31, 1913. LINEAR FEET.
11' x 12' 3" Horseshoe.....	Brick and Concrete.....	26,351.80	.....	26,351.80
10' 9" x 12' Horseshoe.....	Brick and Concrete.....	3,879.21	.....	3,879.21
100" Circular.....	Brick and Concrete.....	5,109.28	.....	5,109.28
90" Circular.....	Brick and Concrete.....	4,610.45	.....	4,610.45
84" Circular.....	Brick and Concrete.....	539.56	.....	539.56
82" Circular.....	Brick and Concrete.....	3,099.00	.....	3,099.00
80" Circular.....	Brick and Concrete.....	3,313.00	.....	3,313.00
76" Circular.....	Brick and Concrete.....	633.60	.....	633.60
75" Circular.....	Brick and Concrete.....	1,594.92	.....	1,594.92
74" Circular.....	Brick and Concrete.....	1,931.00	.....	1,931.00
72" Circular.....	Brick and Concrete.....	1,473.00	.....	1,473.00
66" Circular.....	Brick and Concrete.....	2,911.67	.....	2,911.67
64" Circular.....	Brick and Concrete.....	2,488.75	.....	2,488.75
61" Circular.....	Brick and Concrete.....	829.00	1,425.40	2,254.40
60" Circular.....	Brick and Concrete.....	5,225.18	.....	5,225.18
57" Circular.....	Brick and Concrete.....	742.00	.....	742.00
56" Circular.....	Brick and Concrete.....	367.17	.....	367.17
55" Circular.....	Brick and Concrete.....	1,179.88	1,763.20	2,943.08
52" Circular.....	Brick and Concrete.....	893.72	8,593.80	9,497.52
51" Circular.....	Brick and Concrete.....	2,054.98	.....	2,054.98
50" Circular.....	Brick and Concrete.....	791.78	.....	791.78
48" Circular.....	Brick and Concrete.....	860.94	.....	860.94
45" Circular.....	Brick and Concrete.....	1,440.00	.....	1,440.00
42" Circular.....	Cast-Iron Pipe.....	11,979.63	449.40	12,429.03
36" Circular.....	Cast-Iron Pipe.....	685.00	234.70	919.70
36" Circular.....	Brick and Concrete.....	63.61	421.00	484.61
30" Circular.....	Brick and Concrete.....	604.20	1,608.69	2,212.89

TABLE No. 4—*Concluded.*
LENGTHS OF SANITARY SEWERS OF THE VARIOUS SIZES
AND MATERIALS CON-
STRUCTED TO DECEMBER 31, 1913.

SIZE AND SHAPE.	MATERIAL.	CONSTRUCTED PRIOR TO 1913. LINEAR FEET.	CONSTRUCTED DURING 1913. LINEAR FEET.	CONSTRUCTED TO DEC. 31, 1913. LINEAR FEET.
30" Circular.....	Terra-Cotta Pipe.....	89.20	.....	89.20
27" Circular.....	Brick and Concrete.....	3,474.60	.....	3,474.60
27" Circular.....	Terra-Cotta Pipe.....	3,012.50	725.81	3,738.31
24" Circular.....	Terra-Cotta Pipe.....	9,701.46	2,169.53	11,870.99
24" Circular.....	Cast-iron Pipe.....	297.36	.....	297.36
22" Circular.....	Terra-Cotta Pipe.....	12,867.81	1,855.24	14,663.05
20" Circular.....	Terra-Cotta Pipe.....	6,452.83	664.46	7,117.29
18" Circular.....	Terra-Cotta Pipe.....	9,204.84	1,574.83	10,779.67
16" Circular.....	Cast-Iron Pipe.....	1,240.44	.....	1,240.44
15" Circular.....	Terra-Cotta Pipe.....	25,058.01	6,691.13	32,349.14
12" Circular.....	Terra-Cotta Pipe.....	28,096.14	14,355.32	42,451.46
10" Circular.....	Terra-Cotta Pipe.....	81,178.02	52,460.66	133,638.68
10" Circular.....	Cast-Iron Pipe.....	859.50	.....	859.50
8" Circular.....	Cast-Iron Pipe.....	492.40	110.00	602.40
8" Circular.....	Terra-Cotta Pipe.....	556,632.24	154,489.18	710,089.42
Total length.....	.....	823,958.68	249,592.35	1,073,551.03
House-connections.....	.....	564,798.79	332,046.07	896,844.86
Grand total.....	.....	1,388,757.47	581,638.42	1,970,395.89
Manholes.....	.....	4,317	1,513	5,830
Lampholes.....	.....	425	131	556
Spurs.....	.....	48,656	17,001	65,657

TABLE No. 5.
LENGTH OF STORM-WATER DRAINS OF THE VARIOUS SIZES AND MATERIALS CON-
STRUCTED TO DECEMBER 31, 1913.

SIZE.	MATERIALS.	CONSTRUCTED PRIOR TO 1913. LINEAR FEET.	CONSTRUCTED DURING 1913. LINEAR FEET.	TOTAL TO DEC. 31, 1913. LINEAR FEET.
Double Rectangular, 84" x 60".	Concrete and Brick (Reinf.)	108.30	.....	108.30
Double Rectangular, 69" x 50".	Concrete and Brick (Reinf.)	2856.91	.....	2856.91
Rectangular, 14' x 7' 6".	Concrete and Brick (Reinf.)	447.80	.....	447.80
Rectangular, 132" x 66".	Concrete and Brick (Reinf.)	.....	240.00	240.00
Rectangular, 108" x 36".	Concrete and Brick (Reinf.)	.....	503.50	503.50
Rectangular, 78" x 30".	Concrete and Brick (Reinf.)	.....	61.85	61.85
Rectangular, 72" x 51".	Concrete and Brick (Reinf.)	764.30	.....	764.30
Rectangular, 72" x 36".	Concrete and Brick (Reinf.)	.....	352.65	352.65
Rectangular, 72" x 30".	Concrete and Brick (Reinf.)	.....	68.39	68.39
Rectangular, 66" x 36".	Concrete and Brick (Reinf.)	208.00	.....	208.00
Rectangular, 66" x 45".	Reinforced Concrete	1470.30	.....	1470.30
Rectangular, 64" x 31".	Concrete and Brick (Reinf.)	.....	21.90	21.90
Rectangular, 62" x 42".	Concrete and Brick (Reinf.)	.....	1,660.68	1,660.68
Rectangular, 60" x 42".	Concrete and Brick (Reinf.)	785.90	.....	785.90
Rectangular, 60" x 33".	Reinforced Concrete	.....	237.00	237.00
Rectangular, 60" x 30".	Concrete and Brick (Reinf.)	76.79	323.70	400.49
Rectangular, 56" x 42".	Concrete and Brick (Reinf.)	.....	432.72	432.72
Rectangular, 54" x 36".	Concrete and Brick (Reinf.)	.....	375.55	375.55
Rectangular, 52" x 30".	Concrete and Brick (Reinf.)	.....	401.80	401.80
Rectangular, 48" x 48".	Concrete and Brick (Reinf.)	.....	120.00	120.00
Horseshoe, 12' 3" x 12' 3".	Concrete and Brick	.....	2,509.00	2,509.00
Horseshoe, 12' 0" x 12' 0".	Concrete and Brick	.....	1,717.93	1,717.93

TABLE No. 5—Continued.
 LENGTH OF STORM-WATER DRAINS OF THE VARIOUS SIZES AND MATERIALS CON-
 STRUCTED TO DECEMBER 31, 1913.

SIZE.	MATERIALS.	CONSTRUCTED PRIOR TO 1913. LINEAR FEET.	CONSTRUCTED DURING 1913. LINEAR FEET.	TOTAL TO DEC. 31, 1913. LINEAR FEET.
Horseshoe, 138" x 132".....	Concrete and Brick (Reinf.)..	125.13	.....	125.13
Horseshoe, 138" x 99".....	Concrete and Brick (Reinf.)..	2,212.22	.....	2,212.22
Horseshoe, 120" x 108".....	Concrete and Brick.....	.....	385.00	385.00
Horseshoe, 120" x 87".....	Concrete and Brick.....	.....	49.00	49.00
Horseshoe, 120" x 75".....	Concrete and Brick.....	.....	1,250.00	1,250.00
Horseshoe, 114".....	Concrete and Brick.....	244.65	.....	244.65
Horseshoe, 96" x 93".....	Concrete and Brick.....	56.00	.....	56.00
Horseshoe, 87".....	Concrete and Brick.....	1,300.28	.....	1,300.28
Double Line, 30".....	Cast-Iron Pipe.....	645.17	.....	645.17
Circular, 144".....	Concrete and Brick.....	.....	160.00	160.00
Circular, 120".....	Concrete and Brick.....	.....	9.22	9.22
Circular, 114".....	Concrete and Brick.....	1,112.69	.....	1,112.69
Circular, 96".....	Concrete and Brick.....	3,451.55	.....	3,451.55
Circular, 78".....	Concrete and Brick.....	.....	150.00	150.00
Circular, 72".....	Concrete and Brick.....	1,259.91	.....	1,259.41
Circular, 66".....	Concrete and Brick.....	1,926.04	29.50	1,955.54
Circular, 62".....	Concrete and Brick.....	169.35	725.00	2,651.04
Circular, 60".....	Concrete and Brick (Reinf.)..	245.64	.....	160.35
Circular, 57".....	Concrete and Brick.....	233.09	.....	245.64
Circular, 54".....	Concrete and Brick.....	83.47	329.82	562.91
Circular, 54".....	Concrete and Brick.....	.....	617.98	83.47
Circular, 54".....	Concrete and Brick (Reinf.)..	1,753.05	.....	1,753.05

TABLE No. 5—Continued.
 LENGTH OF STORM-WATER DRAINS OF THE VARIOUS SIZES AND MATERIALS CON-
 STRUCTED TO DECEMBER 31, 1913.

SIZE.	MATERIALS.	CONSTRUCTED PRIOR TO 1913. LINEAR FEET.	CONSTRUCTED DURING 1913. LINEAR FEET.	TOTAL TO DEC. 31, 1913. LINEAR FEET.
Circular, 50"	Concrete and Brick.....	.....	13.00	13.00
Circular, 48"	Concrete and Brick.....	714.84	29.00	743.84
Circular, 48"	Cast-Iron Pipe.....	41.99	.....	41.99
Circular, 48"	Brick.....	1,453.27	4.00	1,457.27
Circular, 48"	Concrete.....	1,624.25	2,701.55	4,325.80
Circular, 45"	Concrete.....	471.51	.....	471.51
Circular, 42"	Cast-Iron Pipe.....	34.35	184.00	218.35
Circular, 42"	Brick.....	1,680.96	.....	1,680.96
Circular, 42"	Concrete and Brick.....	1,751.59	12.26	1,763.85
Circular, 42"	Concrete.....	4,132.47	4,301.56	8,434.03
Circular, 36"	Cast-Iron Pipe.....	24.00	162.00	186.00
Circular, 36"	Brick.....	648.97	7.16	656.13
Circular, 36"	Concrete and Brick.....	7,223.91	25.00	7,248.91
Circular, 36"	Concrete.....	11,014.43	8,810.70	19,825.13
Circular, 33"	Brick.....	44.35	51.45	95.80
Circular, 33"	Concrete and Brick.....	8,004.61	.....	8,004.61
Circular, 33"	Concrete.....	2,642.60	7,150.44	9,793.04
Circular, 30"	Cast-Iron Pipe.....	1,028.33	1,598.25	2,626.58
Circular, 30"	Brick.....	235.67	25.78	261.45
Circular, 30"	Concrete and Brick.....	10,296.51	38.09	10,334.60
Circular, 30"	Vitrified Pipe.....	2,452.19	.....	2,452.19
Circular, 30"	Concrete.....	9,371.77	16,896.36	26,268.13

TABLE No. 5—*Concluded.*
 LENGTH OF STORM-WATER DRAINS OF THE VARIOUS SIZES AND MATERIALS CON-
 STRUCTED TO DECEMBER 31, 1913.

Size.	MATERIALS.	CONSTRUCTED PRIOR TO 1913. LINEAR FEET.	CONSTRUCTED DURING 1913. LINEAR FEET.	TOTAL TO DEC. 31, 1913. LINEAR FEET.
Circular, 27".....	Terra-Cotta Pipe.....	.....	365.31	365.31
Circular, 24".....	Cast-Iron Pipe.....	500.00	419.63	919.63
Circular, 24".....	Terra-Cotta Pipe.....	47,700.50	20,976.43	68,682.99
Circular, 20".....	Cast-Iron Pipe.....	410.83	100.80	511.63
Circular, 20".....	Terra-Cotta Pipe.....	18,418.72	15,177.06	33,595.78
Circular, 18".....	Terra-Cotta Pipe.....	41,397.79	28,964.92	70,362.71
Circular, 18".....	Cast-Iron Pipe.....	20.50	.....	20.50
Circular, 16".....	Cast-Iron Pipe.....	38.70	653.80	692.50
Circular, 15".....	Terra-Cotta Pipe.....	35,068.61	28,691.22	63,759.83
Circular, 12".....	Terra-Cotta Pipe.....	6,597.57	1,813.82	8,411.39
Circular, 12".....	Cast-Iron Pipe.....	.....	170.00	170.00
Circular, 10".....	Cast-Iron Pipe.....	190.00	1,339.34	1,529.34
Circular, 10".....	Terra-Cotta Pipe.....	.....	237.00	237.00
Circular, 8".....	Cast-Iron Pipe.....	150.93	220.07	377.00
Circular, 8".....	Terra-Cotta Pipe.....	.....	52.00	52.00
Circular, 6".....	Cast-Iron Pipe.....	219.84	173.78	393.62
Circular, less than 6".....	Terra-Cotta Pipe.....	.....	70.00	70.00
Jones Falls Conduits.....	Reinforced Concrete.....	2,589.00	3,721.00	6,310.00
Totals.....	.....	239,759.16	157,888.97	397,648.13
Inlet Connections, 10" to 20".....	.....	60,160.59	40,895.11	101,064.70
Grand totals.....	.....	299,928.75	198,784.08	498,712.83
Inlets and Catch Basins.....	2,086	1,640	3,726
Manholes and Drop Wells.....	1,469	848	2,317
Lampholes.....	12	12

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